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PART II:

DEPARTMENT OF TRANSPORTATION

Coast Guard

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CARRIAGE OF BULK DANGEROUS OR EXTREMELY FLAMMABLE LIQUID CARGOES

Proposed Safety Standards for Self Propelled Vessels

DEPARTMENT OF TRANSPORTATION

Coast Guard

[46 CFR Parts 1, 2, 24, 30, 31, 32, 39, 40, 42, 70, 90, 98, 110, 151, 153]

CARRIAGE OF BULK DANGEROUS OR EXTREMELY FLAMMABLE LIQUID CARGOES

Proposed Safety Standards for Self Propelled Vessels

The Coast Guard, acting under the authority of the Dangerous Cargo Act (46 U.S.C. 170), and the Ports and Waterways Safety Act (46 U.S.C. 391a), intends to issue regulations governing the design construction, and operation of all self-propelled U.S. flag vessels engaged in the carriage of certain bulk dangerous cargoes. The regulations would also apply to foreign flag vessels carrying certain bulk dangerous cargoes in U.S. navigable waters.

Interested persons are invited to participate in this proposed rulemaking by submitting written data, views, or arguments to the Executive Secretary, Marine Safety Council (G–CMC/81), Room 8117, 400 Seventh Street, SW. Washington, D.C. 20590. (Telephone 202–426–1477). Each person submitting comments should include his name and address, identify the notice (CGD 73–96), and give reasons for any recommendations. Comments received will be available for examination by interested persons in Room 8117, Department of Transportation, Nassif Building, 400 Seventh Street, SW, Washington, D.C. Copies will be furnished upon paymont of fees prescribed in 49 CFR 7.81.

The Coast Guard will hold a hearing on August 3, 1976, at 0930 A.M. in Conference Room 2232, Department of Transportation, Nassif Building, 400 Seventh Street, SW, Washington, D.C. Interested persons are invited to attend the hearing and present oral or written statements on this proposal. It is requested that anyone desiring to attend the hearing notify the Executive Secretary of the time needed for his presentation at least ten days in adanvce. Written summaries or copies of oral presentations are encouraged.

All communications received before August 20, 1976, will be evaluated before final action is taken on this proposal. The proposed regulations may be changed in the light of comments received.

The proposed regulations contain the vessel design, construction, and operating requirements for carriage of specific liquid cargoes aboard self-propelled vessels. The part, which would be an addition to Subchapter O of 46 CFR (presently limited to barges), would cover certain foreign and U.S. flag vessels, existing and new vessels. In examining the need for these proposals, the Coast Guard has considered its experience with the regulation of these cargoes aboard tank barges, certain of these cargoes aboard foreign and domestic vessels, and in the examination of accidents related to the transportation of these cargoes.

The Coast Guard has long administered regulations for the transportation of such dangerous cargoes in small packages but in most cases has controlled bulk shipments of these cargoes on a case by case basis. However, the frequency of bulk movement and the amount of cargo transported in bulk increased in the 1960's to a considerable extent. Complete regulations for bulk transportation of dangerous liquid and gas cargoes by barges were published in 1969. Similar regulations for self-propelled vessels were not undertaken because the trade was in an emergent state and because the vessels involved were largely foreign registry. The Coast Guard, while conducting a program of control of these ships through the Letter of Compliance technical review, perceived a need to seek development of international standards through the Inter-governmental Maritime Consultative Organization (IMCO). International recommendations covering the transportation of many of these cargoes on self-propelled vessels were undertaken by IMCO in 1967 as a result of this initiative. Since the number of self-propelled vessels transporting these cargoes in U.S. waters was relatively small, the Coast Guard decided to continue with the existing rules for self-propelled vessels while participating in preparation of the IMCO recommendations.

IMCO completed recommendations on bulk liquid cargoes in 1971; this proposal contains essentially all of the IMCO recommendations for these cargoes, and, following IMCO's organization, does not include the liquefied gas cargoes which will be treated in a separate rule. The proposal exceeds the IMCO recommendations by requiring a warning sign (§ 153.952), by requiring a sampling arrangement on tanks carrying cargoes that must have closed gauges, by requiring a pumproom bilge alarm, by prohibiting the carriage of nitropropane in deck tanks, and by placing the following specific requirements on the cargoes named, all of which have been proposed to IMCO for inclusion in the Chemical Code:

Chemical	IMCO	46 CFR—	Supporting data
Acetone cyanohydrin.	.....	153.316—Increased pump-room ventilation.	This product is highly toxic by inhalation. The LC_5 for rats is approximately 62 p/m (4 h).
Ammonium hydroxide (28 pct or less NH_3).	.....	153.236 (c), (f)—materials of construction.	Ammonium hydroxide solution is corrosive to zinc, galvanized steel, and silver.
Butyl methacrylate.	Type D fire protection.	Type B or D fire protection.	B type fire protection was added. Since this product is not soluble in water, regular foam should be an effective firefighting agent.
Carbon disulphide	.....	153.236(c)—Materials of construction.	A mixture of zinc and carbon disulphide may react with incandescence.
Carbon tetrachloride.	Restricted gaging.	153.408—Overfill protection (Closed gaging).	The inhalation health hazard for carbon tetrachloride is high for both acute and chronic exposures. Narcosis with subsequent liver and kidney injury and death may occur as the result of an acute overexposure. Carbon tetrachloride is volatile (115 mm/hg at 25° C) and has poor warning properties. The odor is usually not objectionable at acutely toxic levels.
Dibutyl amine	.....	153.236(c)—Materials of construction.	The use of zinc is prohibited with every other amine and alcohol amine in the code because of corrosion problems. Although specific corrosion data are not available, this product is a typical amine.
1,3-dichloropropene.	Restricted gaging.	Closed gaging	This product causes severe irritation when inhaled. There is a possibility of liver or kidney damage from acute inhalation exposure.
Dimethyl formamide.	Type B fire protection.	Type A fire protection.	Dimethyl formamide is soluble in water. For water soluble products alcohol foam (type A) is recommended.
		153.236(b)—Materials of construction.	This product is corrosive to copper and its alloys.
Epichlorohydrin	.....	153.316—Increased pumproom ventilation.	Epichlorohydrin presents a high hazard for both acute and chronic vapor exposures. The vapors are highly irritating to the mucous membranes of the eyes and respiratory tract. Pulmonary edema and renal damage may occur. Deaths occurred among guinea pigs, rats, and rabbits inhaling 500 p/m for 4 h. The product has a significant vapor pressure (12 mm/hg at 25° C).
Ethylene chlorohydrin.	Restricted gaging.	Closed gaging (153.316—Increased pumproom ventilation).	The vapors of this chemical are highly toxic. There is little margin of safety between early reversible symptoms and fatal intoxication. Absorption by any route, including the skin, may lead to severe illness or death. Symptoms which may result from breathing high concentrations of the vapor are headaches, severe thirst, delirium, collapse, shock, and coma. 250 p/m are lethal to rats in 4 h. The threshold limit value (TLV) for ethylene chlorohydrin is being changed from 5 p/m to C (ceiling) 1 p/m.
	Type C or D fire protection.	Type A, C, or D fire protection.	Because this product is soluble in water, alcohol foam (type A) should be an effective firefighting agent.
Ethylene dibromide.	Restricted gaging.	Closed gaging 153.408—Overfill protection).	The inhalation hazard for an acute exposure is high. The LC_{50} for rats (1 h) is 630 p/m. Ethylene dibromide causes irritation of all exposed tissues (respiratory tract, skin, and eyes. Death can occur from skin absorption. The derma LD_{50} for rabbits is approximately 300 mg/kg.
2-methyl-5-ethyl pyridine.	Type B fire protection.	Type A fire protection.	For water soluble products, alcohol foam (type A is recommended.
(Alpha-)methyl styrene.	Type A or D fire protection.	Type B or D fire protection.	For products not soluble in water, regular foam (type B) is recommended.
	.....	153.912(a)—Inhibition.	It is necessary to inhibit this monomer for safe shipment.

Chemical	IMCO	46 CFR—	Supporting data
Morpholine	Open gaging	Restricted gaging	Morpholine is irritating to the respiratory tract, eyes, and nose.
Naphthalene	Type A, C, or D fire protection.	Type B, C, or D fire protection.	For products not soluble in water, regular foam (type B) is recommended.
(Mono-) nitrobenzene.	do	do	Do.
Oleum	4 m vent height	B/3 vent height	Oleum fumes spontaneously in air-forming mists of sulfuric acid and sulfur trioxide. These products cause severe local burning of nose and air passages. The vapor pressure at 20° C can vary between 1 and 190 mm/hg depending on the concentration.
Propionic acid	Open gaging	Restricted gaging	Inhaling the vapors of propionic acid will cause moderate to severe irritation. These effects are similar to those resulting from breathing acetic acid vapors.
Tetrahydrofuran		153.912(b)—stabilization.	In common with other ether solvents, unstabilized tetrahydrofuran slowly forms an organic peroxide when exposed to air. Stabilization of this product will prevent peroxide accumulation and minimize the possibility of decomposition reactions.
Toluene diisocyanate.		153.316—Increased pumproom ventilation.	The acute inhalation toxicity of toluene diisocyanate is severe. Asthmatic attack with chest pain and severe coughing result from breathing high concentrations. Sensitization has occurred in a number of instances after exposure to the vapors. Subsequent exposure to even very low concentrations may then result in effects more severe than those observed after an initial exposure. The threshold limit value (TLV) for toluene diisocyanate is C (ceiling) 0.02 p/m.
Tricresyl phosphate (containing 1 pct or more of the ortho- isomer).		153.525(a)—Usually toxic cargoes.	Several poisoning epidemics have occurred because of contamination of the meta- and para-isomers of tricresyl phosphate by the much more toxic ortho-isomer. Ingestion of small amounts of tri-orthocresyl phosphate causes, after a latent period of 5 to 28 d, sharp, cramplike pains in the calve and numbness in the hands and feet. Increasing weakness of the legs and feet follow and there may be progression involving the fingers or wrists. Extent to which the paralysis will be permanent appears to depend on the quantities taken in over a short period, rather than being the result of a cumulative effect from the intake of small quantities over long periods. The minimum paralytic dose in man is not known, but estimated to be between 10 and 30 mg/kg for adults. This range of values indicates that even very low levels will produce serious toxic effects.
Vinyl toluene	Type A fire protection.	Type B fire protection.	For products not soluble in water, regular foam (type B) is recommended.

To further ensure the practicality of the proposals, the Coast Guard asked the assistance of a SOLAS subcommittee and the Chemical Transportation Industry Advisory Committee (CTIAC), formerly the Chemical Transportation Advisory panel (CTAP). The CTIAC formed a task group that has participated in the development of these proposed regulations since August 1968. The Coast Guard believes these proposals are technologically and economically feasible. They are patterned after internationally developed standards in which many nations with large shipping interests have participated, and they are similar to the (1971) recommendations of the CTIAC.

The proposed rules apply to a "tankship", defined as a self-propelled vessel having on board a permanently affixed tank containing any quantity of one of the cargoes listed in the part. Thus, a vessel must meet these requirements unless her cargo tanks have been cleaned and freed of any listed cargo. (Vessels other than traditional tankers are included under these regulations. A conventional dry cargo ship, for example, would have to meet the hull type and cargo tank requirements if she wanted to carry a cargo in her deep tanks.)

The requirements for foreign flag vessels differ slightly from those for U.S. flag. A footnote to § 153.9 says that an IMCO Certificate of Fitness (issued under the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk) is generally sufficient basis for the Coast Guard to endorse a Letter of Compliance with the cargoes on the Certificate. The Coast Guard intends to accept an IMCO Certificate except in cases such as the following:

(a) When the Certificate authorizes a cargo that is not permitted to be shipped in U.S. waters, such as with beta-propiolactone, a suspected carcinogen not generally shipped in large quantities.

(b) When the Certificate is in error or requirements of the Code have been waived by the issuing administration, for example, if isopropylamine were authorized for a tank that did not have either pressure containment or refrigeration equipment; or

(c) When the regulations in the part exceed those in the Code, for example, where the Coast Guard would require that heating coils to tanks containing nitropropane be disconnected.

Data collected between 1969 and 1973 indicate that, worldwide, tankers carrying oil were involved in 162 groundings and 210 collisions, with the subsequent release of an estimated 400,000 long tons of cargo. Many cargoes listed in Table I are presently carried in conventional oil tankers. Because of the hazards of the listed cargoes, many of them should be transported only in vessels even more able to retain them following an accident than those generally used for the transportation of oil, and in all cases should be handled using equipment specifically designed to minimize their hazards.

To ensure a consistent evaluation of the relative hazard posed by each of the hundreds of cargoes shipped in bulk, the Coast Guard established a Cargo Hazard Evaluation Panel under the National Academy of Sciences. This panel has evaluated each of the cargoes contained in this proposal as well as many others not mentioned. Those cargoes proposed to be regulated herein were shown by the panel's evaluation to require particular attention if they are to be safely moved in bulk. The Coast Guard believes that an uncontrolled release of a listed cargo would pose a significant safety hazard to the vessel's crew, to the vessel itself, to the terminal facilities engaged in transferring the cargo, and to the population surrounding the ports and waterways through which the vessel moves because of the cargo's unusual flammability, toxicity, corrosiveness, reactivity, oxidizing potential, instability, or a combination of these properties. Since all cargoes do not have equally grave hazards, the cargoes are divided into three classes, each of which is assigned minimum containment system standards. The most hazardous cargoes are required to be transported in a type I containment system, those of least hazard in a type III containment system, and those of intermediate hazard in a type II containment system.

It is the intent of these regulations that the hazard in shipping each cargo be reduced to an acceptable level by designing and operating each cargo's containment system in a way that reduces the possibility of an uncontrolled release and limits the extent of any such release. Uncontrolled release of a cargo in either the liquid or vapor phase may result from collision, grounding, venting, leak or rupture of tanks or piping, fire, explosion, equipment failure, or personnel error. To minimize the possibility of such release, the rule proposes standards for hull and tank construction, vessel arrangement, piping, valving, gauging and venting, temperature and pressure control systems, testing and inspection, cargo transfer operations, and maintenance that are briefly summarized in table I, the Table of Minimum Requirements.

In developing standards for these containment systems, the Coast Guard's first goal was to minimize the chance of a vessel's sinking after a collision or grounding, a circumstance that may result in the eventual release of all her cargo. Under the provisions of the rule, each vessel must be able to survive a specified amount of damage anywhere in her cargo and ballast spaces. The vessels are then divided into "hull type" categories according to the extent of flooding, whether by external injury or by internal breach of piping, that each must withstand in way of her machinery space and remain afloat in stable equilibrium.[1]

[1] It is noted that there is a potential disparity in the requirements for damage to machinery space bulkheads for type III ships over 125 m. The proposed rule, in § 153.22 (b), and the IMCO Chemical Code do not require that damage to transverse bulkheads bounding an aft machinery space be considered. The 1973 Marine Pollution Convention, were it ratified, would require such damage to be considered on all tankers of more than 225 m. This apparent conflict is being evaluated by the Coast Guard and by IMCO.

In all cases, the parameters chosen to define the extent of damage and the criteria for surviving it are those recommended by IMCO, which analyzed accident data to determine mean damage dimensions and distribution of the point of contact for two vessels in collision. The hull category providing the greatest protection against sinking is called the type I hull, the least protection the type III hull, while the type II hull is intermediate. The standards for a containment system require that it be carried in a hull whose numerical type designation is the same or lower than the numerical type designation of the containment system: for example, a type II containment system may be carried in either a type II or a type I hull, but not in a type III hull.

Since cargo may be lost from a vessel that is damaged but does not sink, a hull type is insufficient to fully anticipate the problems that may arise in a collision. To more completely control the probability of a cargo release, one must control how close to the vessel's shell a cargo containment system may be placed (affecting the probability that the system would be damaged in an accident) and the amount of cargo in the containment system's cargo tank (affecting the amount of cargo that would be released if a system were damaged). The proposed standards covering these areas are those recommended by IMCO and are related to the statistically derived damage penetrations used by that organization in defining hull types. The components of a type I containment system must lie beyond the collision and grounding penetrations assumed in defining hull types, while the amount of cargo loaded into a tank may not exceed 1250 m^3. The components of a type II containment system must lie beyond the assumed grounding penetration and must be inboard of the hull at least 760 mm, while the amount of cargo loaded into a tank may not exceed 3000 m^3. The type III containment system may be adjacent to the hull and has no defined cargo quantity limit, although the type III hull requirements tend to limit any one tank's capacity.

Thus, the IMCO document recognizes four categories of bulk liquid cargoes. One category may be described as "cargoes to which the code does not apply", i.e. those liquids that do not fall within the definition of "bulk dangerous chemicals". "Bulk dangerous chemicals" may be loosely defined as products having hazards in addition to, or other than, those associated with normal petroleum products. The "cargoes to which the code does not apply" do not have to be carried in a chemical tanker and are not subject to this proposal. The other three categories are related to the hull types. Cargoes required to be carried in Type III ships are products for which the risk level is analogous to normal petroleum products but of a different nature. They are not required to be carried in tanks separated from the hull. The other two categories are cargoes that are required to be carried in tanks separated from the hull because of the potential hazard they present to the safety of the crew, the vessel and people in the surrounding area. These cargoes include water reactive cargoes, cargoes that become more corrosive in the presence of water, cargoes with high toxicity to humans, cargoes with unusual flammability characteristics, and other properties that make their potential release a serious safety risk. Tank separation from the hull does not necessarily mean double hull protection, although that is a method of meeting the requirement. Type III cargoes or "cargoes to which the code does not apply" can be carried in outboard tanks.

Products in all four categories may pose potential pollution threats; however, the polluting nature of the products, for the purposes of IMCO Resolution A 212 (VII) and this proposal, was not directly considered when placing the product in a category. In the future, IMCO will be revising the criteria for categorization of these cargoes with pollution of the marine environment in mind. In addition, the EPA list of hazardous polluting substances may cause the Coast Guard to reevaluate these products on the basis of their pollution potential. In this proposal, however, the requirement for tanks in Types I and II ships to be located certain distances from the hull, is promulgated for the safety of the vessel, ship personnel, ports, and the surrounding inhabitants.

The proposal contains several requirements to protect the crew from contaminated ballast and from exposure to cargo vapors drifting from the deck area. The cargo containment systems of new vessels would have to be located forward of all accommodation spaces; tanks beneath or aft of a deckhouse would not be endorsed to carry any of the listed cargoes. Portlights in the forward part of the deckhouse superstructure would have to be of the fixed type. Windows and doors in the forward part of the deckhouse would have to seal hosetight when closed. Ballast piping serving a dedicated ballast tank adjacent to a cargo tank could not enter an accommodation space or engine room.

Tank construction, piping and valving standards proposed are, in general, the same as existing standards for tank ships contained in Parts 32, 54, and 56 of Title 46, Code of Federal Regulations.

Proposed regulations for vent systems are substantially different from those that apply to conventional tank ships but are in agreement with IMCO standards. To protect people from toxic vapors and to direct flammable vapors to the atmosphere at safe distances from sources of ignition, a minimum vent height of either 4 meters or of one-third the vessel's beam is included most cargoes, the minimum height depending on the degree of hazard the cargo vapor has. To prevent toxic or explosive concentrations of cargo vapor from accumulating in enclosed spaces, any vent system discharge must be at least 10 meters from air intakes or openings in accommodations or service spaces.

Since certain enclosed spaces, such as cargo pumprooms and rooms containing cargo valves, are routinely exposed to cargo that may leak from seals and packing, they must have forced ventilation to prevent toxic or flammable vapor accumulation. Ventilation machinery must change the air in a space at least 30 times per hour, exhaust to a safe location, and avoid the recycling of exhausted vapors. Pumprooms handling certain toxic cargoes noted in table I must have ventilation rates of 45 changes per hour.

Because the crew enters them frequently, cargo pumprooms must have remotely controlled bilge systems so that cargo leakage can be pumped out safely. Furthermore, each pumproom must have an access way from the weatherdeck of sufficient size to permit a man wearing an air breathing apparatus to enter and remove an unconscious person.

Table I prescribes either a closed, restricted, or an open gauging system according to how harmful to the gauger exposure to the cargo may be. Both closed and restricted gauging systems include a requirement for a sampling arrangement that limits exposure of the persons taking the samples of the cargo. Restricted gauges, such as sounding tubes, may be installed on any cargo tank but may not be used if the cargo in the tank requires a closed gauging system. Other provisions included with the gauging system requirements prescribe the percentage of tank capacity that closed and restricted gauges must read and overfill alarms for closed gauging systems. Spill valves may be used to prevent a tank's rupture in overfill, but each valve must have a receiving container of at least 0.6 m^3 (approx. 4 barrels) capacity.

Pressure-vacuum relief valves, as well as their relieving pressures, are specified for many cargoes. The minimum relieving pressure, called the relief valve setting, for a tank containing a cargo at ambient temperature that requires a pressure relief valve is specified to be the cargo's vapor pressure at 46° C (approx. 115° F). A refrigerated tank's relief valve setting must at least equal 110% of the cargo's vapor pressure at the equilibrium temperature reached by the cargo with both the refrigeration equipment and the tank operating in ambient conditions of 46° C still air and 32° C (approx. 90° F) still water.

Vapor return connections are required for cargoes whose vapor pressures at 37.8° C (approx. 100° F) exceed one atmosphere, for those cargoes requiring a closed gauging system, and for cargoes having unusually severe toxicity.

A filling line may terminate no more than 100 mm above the bottom surface of the cargo tank to reduce the splashing that increases vapor evolution and the rate of static charge generation.

The requirements applying to emergency shutdown stations are intended to ensure that one could reach a station and stop cargo transfer in the event a cargo hose broke, pouring cargo in the

area of the hose connection. Thus one station would likely be forward of the hose connecting point, the other aft.

Many of the cargoes that would be regulated under the proposal require special containment systems, such as ones having temperature control, tank insulation, inert gas padding, or tank lining, or require special treatment such as chemical inhibition. A special requirement of this sort would be mandatory when the "special requirements" column of table I refers to the section containing the requirement.

One of the most critical times in the transportation of hazardous materials is the transfer of cargo from ship to terminal or vice-versa. A great potential for disaster exists during this operation because of the proximity of the vessel to people and property. Additionally, the very act of moving the cargo entails personal judgment, the use of additional equipment and machinery, coordination between vessel and terminal personnel, and a greater risk of exposure to the cargo.

Many of the proposals pertinent to the safe handling and transfer of cargo are similar to those contained in Subchapter D of 46 CFR since 1965 and Part 151 of 46 CFR in 1970. For example, since the safe handling of hazardous cargoes requires knowledge of their peculiar properties, a cargo information card describing each cargo, its associated hazards, and routine and emergency procedures would be required to be aboard the vessel and at the terminal. Additional sources of information required would be a copy of this proposed part, a copy of Parts 34 and 35 of Title 46, a cargo location plan, warning signs, and, in some cases, a certification of cargo inhibition or stabilization.

With the exception of certain circumstances in which he could be a tankerman, the person in charge of cargo transfer on U.S. flag vessels would be required to hold a license as master or mate for the vessel that is transferring cargo. The rules under which the Coast Guard would endorse the license of masters and mates of these vessels to transfer cargoes will be published shortly in Subchapter B of Chapter I, Title 46, Code of Federal Regulations. However, at this time the rules have not been finalized; neither has a rule governing the qualifications of the person in charge of cargo transfer for a foreign flag vessel. Therefore, the description of the prerequisites for being the person in charge of cargo transfer proposed in this new part are contingent upon the forthcoming rulemaking for 46 CFR Part 10.

The Coast Guard's goal in making these proposals is that no cargo be untrollably released either as vapor or liquid. However, the degree to which one guards against a release should correspond to the severity of the consequences. Hence, some cargoes require more sophisticated handling than others to present equally low risks. Special operating requirements have been included for alkylene oxides, unusually toxic products, motor fuel antiknock compounds, carbon disulphide, inorganic acids, and others. These requirements are similar to those that apply to the same cargoes aboard unmanned barges in 46 CFR Part 151.

There are also requirements governing cargo sampling procedures, discharge by gas or fluid displacement, emergency termination of transfer, and the movement of vessels alongside the transferring vessel. These requirements necessitate discretionary judgments by the person in charge of transfer; they are currently followed on barges and on foreign flag vessels in U.S. ports as a result of regulation, Captain of the Port requirements, and good practice.

The Coast Guard anticipates that in combination with vessel movement restrictions imposed by local Captains of the Port and the more thorough training and testing that the Coast Guard intends to propose as a prerequisite for transferring the listed cargoes, the proposed rules will significantly reduce the likelihood of life and property losses.

Existing vessels would, of course, need modification in many instances to meet the proposed standards. To allow the owners of vessels that have been carrying these cargoes a flexible schedule whereby they can bring their vessels into compliance, the Coast Guard has included a phase-in period covering five years. The Coast Guard has attempted to follow IMCO's recommendations in grouping requirements for phase-in according to the time a vessel needs to meet them and their importance in controlling the cargo's hazards. The operating requirements would become effective immediately, a group of pumproom ventilation requirements and some tank location restrictions on type I and II ships before 2 years, and virtually all of the remaining requirements within 5 years after the effective date of the rule. Following the IMCO guidelines, the Coast Guard would examine each existing ship that could not meet the damage stability or deckhouse location requirements. The Coast Guard might then endorse the ship for the cargoes in table I that it has carried in the past.

Since the proposals contained in the new part cover some areas that are covered by existing regulations, the Coast Guard has proposed to cancel these existing regulations (46 CFR Part 39 and some portions of Parts 40 and 98). To be consistent with the IMCO Chemical Code, Part 32 would be amended to require a 13.2 foot (4 meter) vent riser with grade A flammables rather than the B/3 riser presently required. Additionally, amendments to other existing parts dealing with the organizational structure of the Coast Guard are included to accommodate the new part and explain its administration and that of certain related regulations.

The Coast Guard has thoroughly reviewed the environmental effects of this proposal as described in "Environmental Impact Statements—Procedures for Consideration", FEDERAL REGISTER, Vol. 40, October 22, 1975, Pg. 48303. We found that the proposal will have no foreseeable significant adverse impact on the human environment.

The Coast Guard has also evaluated the inflationary effects of this proposal. The proposal is not a "major proposal" under the Department of Transportation's "Interim Guidance for the Preparation of Inflation Impact Statements".

Having considered the need for, the contribution to safety made by, and the practicality of these regulations, and to discharge its responsibilities under 46 U.S.C. 170 and 391a, the Coast Guard proposes to amend Chapter I of Title 46 of the Code of Federal Regulations by revoking Part 39; amending Parts 1, 2, 24, 30, 31, 32, 40, 42, 70, 90, 98, 110, and 151 thereof; and adding a new Part 153 as follows:

PART 1—ORGANIZATION, GENERAL COURSE AND METHODS GOVERNING MARINE SAFETY FUNCTIONS

1. In § 1.01(b)(1), by inserting the words "Chief, Cargo and Hazardous Materials Division," immediately after the words "Chief, Merchant Vessel Inspection Division."

2. By adding § 1.01(b)(1)(iv) to read as follows:

§ 1.01 Organization.

* * * * *

(b) * * *

(1) * * *

(iv) The Chief, Cargo and Hazardous Materials Division at Coast Guard Headquarters, under the direction of the Chief, Office of Merchant Marine Safety, administers the program for the development of safe containment systems for certain bulk dangerous cargoes, administers the foreign vessel inspection program for foreign vessels carrying cargoes of potential unusual operating risks, and evaluates the hazards involved in the shipment of dangerous cargoes.

§ 1.20 [Amended]

3. By striking out in the third sentence of § 1.20(b) the word "three" and inserting the word "four" in place thereof.

PART 2—VESSEL INSPECTIONS

§ 2.01–1 [Amended]

4. By adding in § 2.01–1(c) the words "O (Certain Bulk Dangerous Cargoes)," immediately after the words, "J (Electrical Engineering)".

5. By adding § 2.01–7(b)(6) to read as follows:

§ 2.01–7 Classes of vessels (including motorboats) examined or inspected and certificated.

* * * * *

(b) * * *

(6) For vessels carrying certain bulk dangerous cargoes see Subchapter O of this Chapter.

6. By revising footnote number 10 to Table 2.01–7(a) to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01–10(b) and in table I of Part 153 of this chapter" and in table 2.01–7(a) by revising column 8 to read as follows:

[Cols. 3 through 7 omitted]

Col. 1	Col. 2	Col. 8
Steam	Vessels not over 65 ft in length	All vessels carrying in bulk the cargoes listed in table I of pt. 153.
	Vessels over 65 ft in length	Do.
Motor	Vessels not over 15 gross tons	Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	Do.
Sail	Vessels not over 700 gross tons	Do.
	Vessels over 700 gross tons	Do.

• • • • • • •

§ 2.01–13 [Amended]

7. By revising § 2.01–13(c) to read as follows: "For details concerning application of regulations to foreign vessels, see Part 30 (Tank Vessels), Part 70 (Passenger Vessels, Part 90 (Cargo and Miscellaneous Vessels), § 146.02–2 (Dangerous Cargoes), Part 148 (Bulk Solid Hazardous Materials, Parts 153 and 154 (Certain Bulk Dangerous Cargoes), and Part 175 (Small Passenger Vessels) of this chapter.

8. By adding § 2.01–15(a)(10) to read as follows:

§ 2.01–15 Vessel repairs.

• • • • •

(a) • • •

(10) For vessels carrying compressed gases regulated by Subchapter O (Certain Bulk Dangerous Cargoes), see § 151.50–30(c) of this chapter.

• • • • •

§ 2.01–25 [Amended]

9. By revising the last sentence of § 2.01–25(b)(1) to read as follows: "Further details are set forth in Subchapter D (Tank Vessels), Subchapter H. (Passenger Vessels), Subchapter I (Cargo and Miscellaneous Vessels), Subchapter O (Certain Bulk Dangerous Cargoes), and Subchapter T (Small Passenger Vessels) of this chapter."

10. By revising § 2.20–70(d) to read as follows:

§ 2.20–70 Detailed hazardous materials incident reports.

• • • • •

(d) Form: Copies of Form DOT F–5800.1 and USCG Form CF–4752 are available from any District Commander of the U.S. Coast Guard without charge upon request.

• • • • •

11. By adding § 2.90–1(h) to read as follows:

§ 2.90–1 General requirements.

• • • • •

(h) The requirements for vessels carrying certain bulk dangerous cargoes are in parts 148, 151, and 153 of this chapter.

PART 24—GENERAL PROVISIONS

§ 24.05–1 [Amended]

12. In § 24.05–1(a), by repeating change 6.

PART 30—GENERAL PROVISIONS

§ 30.01–5 [Amended]

13. By revoking § 30.01–5(b) (8) and (9).

14. In § 30.01–5(d), by repeating change 6.

§ 30.10–15 [Amended]

15. § 30.10–15, by striking out the second sentence.

§ 30.10–22 [Amended]

16. In § 30.10–22, by striking out the second sentence.

17. By revising § 30.25–1 to read as follows:

§ 30.25–1 Cargoes carried in vessels certificated under the rules of this subchapter.

The cargoes listed in Table 30.25–1 and mixtures composed solely of these cargoes have been foundt to be flammable or combustible and may be transported in bulk only in vessels certificated under the rules of this subchapter.[1]

TABLE 30.25–1

Acetone
Amyl Actate (iso-, n-)
Amyl Alcohol (n-)
Amyl Tallate
Asphalt
Asphalt Blending Stocks:
  Roofers Flux
  Straight Run Residue
Butane
Butyl Acetate (iso-, n-, sec-)
Butyl Alcohol (iso-, n-, sec-, tert-)
Butyl Benzyl Phthalate
Butylene
1,3-Butylene Glycol
Cumene
Cycloaliphatic Resins
Cyclohexane
Cyclohexanol
Cymene (para-)
Decyl Alcohol (iso-, n-)
Decyl Benzene (-n)
Decyl Benzene (n-)
Decaldehyde (iso-, n-)
Decene
Diacetone Alcohol
Dibutyl Phthalate (ortho-)
Diethylbenzene
Diethylene Glycol
Diethylene Glycol Monobutyl Ether (Methyl Carbitol)
Diethylene Glycol Monobutyl Ether Acetate
Diethylene Glycol Monoethyl Ether
Diethylene Glycol Monomethyl Ether
Diglycidal Ether of Bisphenyl A
Dieheptyl Phthalate
Diisobutylene
Diisobutyl Carbinol
Diisobutyl Ketone
Diisodecyl Phthalate
Dinonyl Phthalate
Dioctyl Phthalate
Diphenyl-diphenyl oxide
Dipropylene Glycol
Distillates:
  Straight Run
  Flashed Feed Stocks
Diundecyl Phthalate
Dodecanol
Dodecylbenzene (commercial)
Epoxylated Linear Alcohols, C11–C15
Ethane
Ethoxylated Alcohols, C12–C15
Ethoxy Trigylcol (crude)
Ethyl Acetate
Ethyl Alcohol
Ethyl Benzene
Ethyl Butanol
Ethylene
Ethylene Glycol
Ethylene Glycol Monobutyl Ether
Ethylene Glycol Monobutyl Ether Acetate
Ethylene Glycol Monoethyl Ether
Ethylene Glycol Monoethyl Ether Acetate
Ethylhexaldehyde
2-Ethyl Hexanol
Ethyl Hexyl Tallate
Farfuryl Alcohol
Gas Oil: Cracked
Gasoline Blending Stocks:
  Alkylates
  Reformates
Gasolines:
  Casinghead (natural)
  Automotive, containing not over 4.23 grams lead per gallon)
  Aviation (containing not over 4.86 grams lead per gallon)
  Polymer
  Straight Run
Gylcerine
Glycol Diacetate
Glyoxal (40%)
Heptane
Heptanol
Hexane (iso-, n-)
Hexanol
Hexene
Hexylene Glycol
Isophorone
Jet Fuels:
  JP–1 (Kerosene)
  JP–3
  JP–4
JP–5 (Kerosene, Heavy)
Kerosene
Latex, Liquid Synthetic
Methane
Methyl Acetate
Methyl Alcohol
Methyl Amyl Acetate
Methyl Amyl Alcohol
Methyl Ethyl Ketone
Methyl Formal (Dimethyl Formal)
Methyl Isobutyl Ketone
Methyl Isobutyl Carbinol
Mineral Spirits
Naptha:
  Solvent
  Stoddard Solvent
  Varnish Makers' and Painters' (75%)
Nonane
Nonene
Nonyl Alcohol
Nonyl Phenol
Nonyl Phenol (ethoxylated)
Octene
Octyl Alcohol (iso-, n-)
Octyl Aldehyde (iso-)
Octyl Epoxytallate

[1] See Part 153 of this chapter for additional rules governing the bulk carriage of dangerous cargoes.

Oils:
Absorption
Aromatic
Clarified
Coal Oil
Coal Tar
Croton
Crude Oil
Diesel Oil
Fuel Oils:
No. 1 (Kerosene)
No. 1-D
No. 2
No. 2-D
No. 4
No. 5
No. 6
Heartcut Distillate
Lubricating
Mineral Seal
Mineral
Motor
Neatsfoot
Linseed
Penetrating
Range
Residual
Resin
Resinous Petroleum
Road
Rosin
Sperm
Spindle
Spray
Tall
Tanner's
Transformer
Turbine
Edible Oils, Including:
Castor
Coconut
Cotton Seed
Fish
Lard
Olive
Palm
Peanut
Safflower
Soya Bean
Tucum
Vegetable
Pentadecanol
Pentane (iso-, n-)
1-Pentene
Petrolatum
Petroleum Naphtha
Phosphorized Bicyclic Terpine
Phthalate Plasticizers
Polybutene
Polyethylene Glycols
Polymerized Esters
Polypropylene
Polypropylene Glycol Methyl Ether
Polypropylene Glycols
Propane
Propyl Acetate (iso-, n-)
Propyl Alcohol (iso-, n-)
Propylene
Propylene Butylene Polymer
Propyl Ether (iso-)
Propylene Glycol
Propylene Tetramer
Sorbitol
Soybean Oil (Epoxidized)
Sulfolane
Tallow
Tetradecanol
Tetradecene
Tetradecyl Benzene
Tetraethylene Glycol
Tetrahydronaphthalene
Toluene
Tridecanol
Tridecene
Tridecyl Benzene
Triethyl Benzene
Triethylene Glycol
Triethylene Glycol Diethyl Butyrate
Tripropylene Glycol
Turpentine
Undecanol
Undecene
Undecylbenzene
Waxes:
Carnauba
Paraffin
Xylene (meta-, para-, ortho-)
Zince Dialkyldithiophosphate

§ 30.25–5 [Revoked]

18. By revoking § 30.25–5 and table 30.25–5.

PART 31—INSPECTION AND CERTIFICATION

§ 31.05–1 [Amended]

19. By striking out the last sentence in § 31.05–1(b).

PART 32—SPECIAL EQUIPMENT, MACHINERY, AND HULL REQUIREMENTS

§ 32.55–20 [Amended]

20. By revising the first sentence of § 32.55–20(b)(1) to read as follows:

(1) Cargo tanks on which Grade A liquids are to be transported shall be fitted with a venting system consisting of a branch vent line from each cargo tank connected to a vent header which shall extend to a height above the weatherdeck equal to at least 13.2 feet and shall terminate at a comparable distance from any living or working space, ventilator inlet, or source of ignition. * * *

PART 39—FLAMMABLE OR COMBUSTIBLE LIQUIDS HAVING LETHAL CHARACTERISTICS [REVOKED]

21. By revoking Part 39.

PART 40—SPECIAL CONSTRUCTION, ARRANGEMENT, AND OTHER PROVISION FOR CARRYING CERTAIN FLAMMABLE OR COMBUSTIBLE DANGEROUS CARGOES IN BULK

§§ 40.10–1—40.10–87 [Subpart 40.10] [Revoked]

22. By revoking Subpart 40.10.

PART 42—DOMESTIC AND FOREIGN VOYAGES BY SEA

§ 42.20–5 [Amended]

23. In § 42.20–5(a–1), by adding the words "46 CFR 153.20, 153.21, or 153.22" immediately after the words "33 CFR 157.21".

PART 70—GENERAL PROVISIONS

§ 70.05–1 [Amended]

24. In § 70.05–1(a), by repeating change 6.

PART 90—GENERAL PROVISIONS

§ 90.05–1 [Amended]

25. In § 90.05–1(o), by repeating change 6.

PART 98—SPECIAL CONSTRUCTION, ARRANGEMENT, AND PROVISIONS FOR CERTAIN DANGEROUS CARGOES IN BULK

§ 98.01–5 [Amended]

26. By revoking § 98.01–5(d).

27. By striking out the first sentence of § 98.01–5(e).

§§ 98.05–1—98.05–60 [Subpart 98.05] [Revoked]

28. By revoking subpart 98.05.

§§ 98.10–1—98.10–50 [Subpart 98.10] [Revoked]

29. By revoking subpart 98.10.

§§ 98.15–1—98.15–50 [Subpart 98.15] [Revoked]

30. By revoking subpart 98.15.

§§ 98.18–1—98.18–50 [Subpart 98.18] [Revoked]

31. By revoking subpart 98.18.

PART 110—GENERAL PROVISIONS

§ 110.05–1 [Amended]

32. In § 110.05–1(a), by repeating change 6.

PART 151—UNMANNED BARGES

§ 151.01–10 [Amended]

33. By amending table 151.01–10(d) by repeating the entries in table 30.25–1 of change 17.

34. In § 151.01–10(f), by repeating change 6.

35. By amending Subchapter O, Certain Bulk Dangerous Cargoes, by adding a new Part 153 to read as follows:

PART 153—SAFETY RULES FOR SELF PROPELLED VESSELS

Subpart A—General

Sec.

153.1 Applicability.
153.2 Definitions.
153.5 Carriage of hazardous or inflammable cargo in bulk.
153.7 Existing tankships.
153.8 U.S. flag vessel endorsement application.
153.9 Foreign flag vessel endorsement application.
153.10 Equivalent standards.
Table I—Table of Minimum Requirements

Subpart B—Requirements

GENERAL

153.15 Requirements for U.S. flag vessel permits.
153.16 Requirements for foreign flag vessel permits.

HULL TYPE CALCULATIONS

153.20 Type I hull calculations.
153.21 Type II hull calculations.
153.22 Type III hull calculations.
153.30 Permeability of spaces.
153.32 Damage.
153.34 Survival.
153.35 Loadline requirements.

GENERAL VESSEL REQUIREMENTS

Sec.
153.200 Hosetightness of deckhouse portlights, wheelhouse windows, and wheelhouse doors.
153.202 Location of deckhouse doors and airports.
153.208 Ballast equipment.
153.209 Bilge pumping systems.
153.214 Personnel emergency and safety equipment.

CARGO CONTAINMENT SYSTEMS

153.230 Type I system.
153.231 Type II system.
153.232 Type III system.
153.234 Fore and aft location.
153.235 Exceptions to cargo piping location restrictions.
153.236 Prohibited materials.
153.238 Required materials.
153.239 Cast iron prohibited.
153.240 Insulation.
153.250 Double-bottom and deep tanks as cargo tanks.
153.251 Independent cargo tanks.
153.252 Use of spill valves.
153.254 Tank access.
153.256 Trunks, domes, and openings of cargo tanks.
153.258 Tank separation.
153.263 Pressure vacuum gauge.
153.266 Tank linings.
153.267 Special requirement for an independent cargo tank.

CARGO HANDLING EQUIPMENT

153.280 Cargo transfer valving.
153.281 Alternate cargo line valving for tanks adjacent to pumprooms.
153.282 Piping system design.
153.284 Piping point of entry to ship's spaces.
153.286 Cargo piping joints.
153.288 Filling lines.
153.290 Quick closing valve operation.
153.292 Quick closing valve operating time.
153.294 Marking of piping systems.
153.296 Emergency shutdown stations.

CARGO HANDLING SPACE VENTILATION

153.310 Ventilation system type.
153.312 Ventilation system standards.
153.314 Ventilation of spaces not usually occupied.
153.316 Special pumproom ventilation rate.

CARGO PUMPROOMS

153.330 Access.
153.332 Hoisting arrangement.
153.333 Cargo pump discharge pressure gauge.
153.334 Bilge pumping systems.
153.336 Special pumproom location requirements.

CARGO VENTING SYSTEMS

153.350 B/3 and 4 m vent heights.
153.352 B/3 and 4 m vent system outlets.
153.353 High velocity vents.
153.354 Venting system inlet.
153.355 PV venting systems.
153.358 Venting system flow capacity.
153.360 Venting system restriction.
153.362 Venting system drain.
153.364 Venting system supports.
153.366 Spill valves.
153.368 Pressure vacuum valves.
153.370 Minimum RVS for ambient temperature carriage.
153.371 Minimum RVS for refrigerated carriage.
153.372 Vapor return connection for vapor pressures exceeding one atmosphere.

CARGO GAUGING SYSTEMS

153.400 Gauges.
153.404 Containment systems requiring closed gauges.
153.406 Containment systems requiring restricted gauges.
153.407 Restricted gauging system covers.
153.408 Tank overfill controls.

CARGO TEMPERATURE CONTROL SYSTEMS

153.430 Heat transfer systems; general.
153.432 Cooling systems.
153.434 Heat transfer coils within a tank.
153.436 Heat exchange fluid.
153.438 Cargo temperature alarms required.
153.440 Cargo temperature sensors required.

SPECIAL REQUIREMENTS FOR FLAMMABLE OR COMBUSTIBLE CARGOES

153.460 Fire protection systems.
153.461 Electrical bonding of independent tanks.
153.462 Inert gas systems.
153.463 Vent system discharges.
153.464 Fusible elements.
153.465 Flammable vapor detector.

SPECIAL REQUIREMENTS

153.500 Inert gas systems.
153.501 Requirements for dry inert gas.
153.515 Special requirements for extremely flammable cargoes.
153.520 Special requirements for carbon disulphide.
153.525 Special requirements for unusually toxic cargoes.
153.526 Toxic vapor detectors.
153.527 Toxic vapor protection.
153.530 Special requirements for alkylene oxides.
153.545 Special requirements for liquid sulfur.
153.554 Special requirements for acids.
153.555 Special requirements for inorganic acids.
153.556 Special requirements for sulfuric acid and oleum.
153.557 Special requirements for hydrochloric acid.
153.558 Special requirements for phosphoric acid.
153.559 Special requirements for nitric acid (less than 70 percent).
153.600 Special requirements for nitropropane.

TESTING

153.808 Stability test and information.

Subpart C—Operations

GENERAL

153.900 Certificates, letters, endorsements required.
153.901 Document on bridge.
153.902 Cargo antidotes.
153.904 Copy of this subchapter on board.
153.905 Limitations in the endorsement.
153.906 Cargo quantity limitations.
153.907 Cargo information cards.
153.908 Cargo location plan.
153.912 Certificate of inhibition or stabilization.
153.918 Shipping document.
153.920 Copy of shipping document furnished the transfer terminal.
153.922 Obstruction of pumproom ladderways.
153.924 Opening of tanks and cargo sampling.
153.926 Entry into spaces containing cargo vapor.
153.928 Emergencies.

CARGO TRANSFER PROCEDURES

153.950 Person in charge of cargo transfer.
153.951 Signals during cargo transfer.
153.952 Warning signs.
153.953 Incompatible cargo.
153.954 Cargo transfer piping.
153.955 Cargo hose.
153.956 Standards for marking of cargo hose.
153.957 Discharge by gas pressurization.
153.958 Discharge by liquid displacement.
153.960 Approval to begin transfer required.
153.961 Protective clothing required.
153.962 Preparation for cargo transfer.
153.964 Supervision of cargo transfer.
153.966 Gauging with a sounding tube.
153.968 Termination procedures.
153.970 Tank filling limitations.
153.977 Explosives.
153.978 Transfer of packaged cargo of ship's stores.
153.979 Illness, alcohol, drugs.

SPECIAL CARGO PROCEDURES

153.1000 Special operating requirements for cargoes reactive with water.
153.1010 Alkylene oxides.
153.1011 Use of alkylene oxide containment systems and hoses with other products.
153.1020 Unusually toxic cargoes.
153.1025 Motor fuel antiknock compounds.
153.1035 Stabiziliation of acetone cyanohydrin.
153.1040 Carbon disulphide.
153.1045 Inorganic acids.
153.1046 Sulfuric acid.
153.1052 Carriage of other cargoes in acid tanks.
153.1055 Nitropropane.
153.1060 Inerted cargoes.

MAINTENANCE

153.1500 Venting system rupture disks.
153.1502 Fixed ballast relocation.
153.1504 Inspection of personnel emergency and safety equipment.

Appendix—Table II.

AUTHORITY: The safety regulations of this part are issued under 46 U.S.C. 170 for all dangerous cargoes except flammable and combustible liquids, for which the regulations are issued under 46 U.S.C. 391a.

Subpart A—General

§ 153.1 Applicability.

This part prescribes rules that apply to self propelled vessels that have on board the cargoes described in § 153.5 for the purpose of implementing the requirements in the law governing vessels having on board flammable or combustible liquid cargo in bulk (46 U.S.C. 391a) and the law governing the carriage of explosives and other dangerous articles in bulk (46 U.S.C. 170).

§ 153.2 Definitions.

As used in this part:

(a) "B" means the breadth of the vessel in meters and is defined in § 42.13-15 (d) of this chapter.

(b) "Cargo containment system" means a cargo tank, its cargo piping system, its venting system, and its gauging system.

(c) "Cargo handling space" means an enclosed space that must be entered during a routine loading, carriage, or discharge of cargo and that contains a movable element of the cargo containment system having a seal or packing to prevent the escape of cargo, such as a

valve, cargo pump, or cargo vapor compressor.

(d) "Cargo piping system" means a tankship's permanently installed piping arrangement, including any valves and pumps, that carries cargo to or from a cargo tank.

(e) "Cargo tank" means a tank that—

(1) Is part of or permanently affixed to a tankship; and

(2) Carries a cargo listed in this part in any quantity, including residual vapor.

(f) "Closed gauging system" means an arrangement for gauging the amount of cargo in a tank, such as a float and tape or a magnetically coupled float and indicator, that does not have any opening through which cargo vapor or liquid could escape.

(g) "Combustible" is defined in § 30.10–15 of this chapter.

(h) "Intank pump" means a pump—

(1) Located within a cargo tank; and

(2) Whose piping leaves the tank through the top of the tank.

(i) "Emergency shutdown station" means a part of the weatherdeck where the required emergency shutdown controls are clustered.

(j) "Flammable" is defined in § 30.10–22 of this chapter.

(k) "Forward perpendicular" is defined in § 42.13–15(b) of this chapter.

(l) "IMCO" means the Inter-Governmental Maritime Consultative Organization.

(m) "IMCO Certificate" means a Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk issued under the IMCO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Resolution A.212(VII), 1971.

(n) "Independent tank" means a cargo tank that is permanently affixed to the vessel, that is self-supporting, that forms no part of the vessel's hull, and that is not essential to the integrity of the hull.

(o) "Integral tank" means a cargo tank that also is part of the vessel's hull structure so that the tank and the hull are stressed by the same loads.

(p) "L" means the length of the vessel in meters and is defined in § 42.13–15(a) of this chapter.

(q) "Marine inspector" is defined in § 30.10–43 of this chapter.

(r) "Open gauging" means an arrangement for gauging the amount of cargo in a tank through a large opening, such as a tank hatch or ullage opening.

(s) "Open venting system" means a venting system that always allows vapor to flow freely to and from the tank.

(t) "Pressure-vacuum (PV) valve" means a normally closed valve that opens under a preset positive pressure and a vacuum.

(u) "Pumproom" means any enclosed space containing a pump that is part of a cargo containment system.

(v) "PV venting system" means a venting system in which a PV valve controls vapor flow to and from the tank.

(w) "Refrigerated tank" means a cargo tank that carries a cargo that must be cooled to keep the cargo's vapor pressure from exceeding the tank's relief valve setting under ambient conditions of 32° C (approx. 90° F) still water and 46° C (approx. 115° F) still air.

(x) "Relief valve setting (RVS)" means the inlet line pressure at which a vent system's pressure-vacuum or safety relief valve fully opens.

(y) "Restricted gauging system" means a method of gauging the amount of cargo in a tank through an opening of limited size that does not vent the tank's vapor space, such as an unperforated sounding tube, a rotary tube, or a slip tube.

(z) "Safety relief (SR) valve" means a normally closed valve that opens under a preset positive pressure.

(aa) "SR venting system" means a venting system wherein an SR valve controls vapor flow from the cargo tank.

(bb) "Tankship" means any self-propelled vessel made up in part of or having permanently affixed on board a tank that contains a cargo described in § 153.5 in any quantity, including residual vapor.

(cc) "Venting system" means a permanent piping arrangement leading from a cargo tank and used to control the flow of vapor to and from the tank.

§ 153.5 Carriage of hazardous or flammable cargo in bulk.

(a) A hazardous or flammable cargo listed in Table I may be carried in bulk on board self-propelled vessels if the construction and operating requirements of this part are met.

(b) When authorized by the Commandant (G–MHM), a cargo not listed in Table I, Table II, or in § 30.25–1 of this chapter may be carried in bulk on board a self-propelled vessel if the requirements of this part and any additional requirements for that cargo which the Commandant (G–MHM) may prescribe are met.

§ 153.7 Existing tankships.

(a) *Definitions.* (1) "Permit" means a Certificate of Inspection or a Letter of Compliance.

(2) "Existing tankship" means a tankship for which a contract was let on or before (the effective date (E.D.)).

(b) *Endorsements for existing tankships.* (1) The Coast Guard endorses the permit of an existing tankship to carry a cargo listed in table I if—

(i) The tankship held a permit on (E.D.) endorsed for the cargo in question;

(ii) The tankship meets the construction standards under which the Coast Guard issued the permit; and

(iii) The tankship meets the standards in paragraph (c) of this section.

(2) The Coast Guard endorses the permit of an existing tankship to carry a cargo listed in table I if—

(i) The tankship held a permit on (E.D.);

(ii) The Coast Guard did not require the permit to be endorsed with the name of the cargo at any time before (E.D.);

(iii) The tankship meets the construction standards under which the Coast Guard issued the permit;

(iv) The tankship carried the cargo in question; and

(v) The tankship meets the standards in paragraph (c) of this section.

(3) The Coast Guard endorses the permit if an existing tankship to carry a cargo listed in table I if—

(i) The tankship held a permit on (E.D.) endorsed to carry class B or C poisons under Part 39 of this chapter;

(ii) The cargo in question is a class B or C poison;

(iii) The tankship meets the construction standards in Part 39 of this chapter; and

(iv) The tankship meets the standards in paragraph (c) of this section.

(4) The Commandant (G–MHM) authorizes on a case by case basis an endorsed permit for an existing tankship if—

(i) The tankship does not come within the categories described in paragraphs (b)(1) through (3) of this section.

(ii) The tankship meets paragraph (c) of this section; and

(iii) The tankship meets any additional requirements the Commandant (G–MHM) may prescribe.

(c) *Requirements for existing tankships.* In addition to the standards required of existing tankships in paragraph (b) of this section, every existing tankship must meet the sections of this part according to the following schedule:

(1) The following sections in this part apply to an existing tankship after (E.D.): §§ 153.1, 153.2, 153.5, 153.7, 153.8, 153.9, 153.10, 153.208, 153.214, 153.515, 153.520, 153.530, 153.559, and Subpart C.

(2) The following sections in this part apply to an existing tankship after (E.D. +1 year): §§ 153.294, 153.310, 153.312, and 153.316.

(3) The following requirements in this part apply to an existing tankship after (E.D. +3 years) or after the expiration date of the first permit issued to that tankship under this part, whichever date is earlier:

(i) The requirements in table I listed under the columns entitled Tanks-Vent Heights, Tanks-Vent, Tanks-Gauge, Cargo Transfer Control, Fire Protection System, and Electrical Hazard Group & Class.

(ii) Sections 153.239, 153.256, 153.263, 153.280, 153.282, 153.290, 153.292, 153.296, 153.334, 153.350, 153.352, 153.356, 153.358, 153.362, 153.364, 153.366, 153.368, 153.370, 153.372, 153.400, 153.404, 153.406, 153.408, 153.430, 153.432, 153.434, 153.436, 153.438, 153.440, 153.460, 153.461, 153.462, 153.463, 153.464, 153.500 (c) and (d), and 153.545.

(iii) A type I containment system must meet § 153.230(b)(1).

(iv) Unless the Commandant (G–MHM) approves a different standard after reviewing the tankship—

(A) A type I containment system must meet § 153.231(b)(2), and

(B) A type II containment system must be 76 cm (approx. 30 in.) inboard of the side shell when measured at right angles to the centerline at the level of the summer loadline assigned under Subchapter E of this chapter.

(4) After (E. D. +5 years) or after the expiration date of the second permit issued to it under this part, whichever

is earlier, an existing tankship must meet all the requirements of this part except as described in paragraph (c)(5) of this section.

(5) The Commandant (G–MHM) considers on a case by case basis endorsing the permit of an existing tankship that fails to meet §§ 153.20, 153.21, 153.22, or § 153.234. However, in no case may a type II containment system be less than 76 cm from the bottom shell.

§ 153.8 U.S. flag vessel endorsement application.

(a) A person who desires the endorsement required by § 153.900 for a U.S. flag vessel must submit an application as described in § 91.55–15 of this chapter requesting endorsement of the vessel's subchapter D Certificate of Inspection.

(b) The person requesting an endorsement under paragraph (a) of this section must transmit to the Coast Guard when requested—

(1) Hull type calculations;

(2) The plans and information listed in §§ 54.01–18, 56.01–10, 91.55–5 (a), (b), (d), (g), and (h), and 111.05–5(d) of this chapter; and

(3) Any other vessel information, such as plans, design calculations, test results, certificates, and manufacturer's data, that the Coast Guard needs to determine that the vessel meets the standards.

§ 153.9 Foreign flag vessel endorsement application.

(a) A person who desires an endorsement on the Letter of Compliance required by § 153.900 must submit to the Commandant (G–MHM) a copy of the vessel's IMCO Certificate,[1] or an application that includes—

(1) A list of those cargoes in Table I for which the vessel is to receive the endorsement;

(2) The names of the U.S. ports in which the person anticipates operating the vessel;

(3) The name of the vessel's country of registry;

(4) The name of the society that classes the vessel; and

(5) A brief description of the vessel's cargo containment systems.

(b) All correspondence and vessel information must be in English.

(c) The person requesting an endorsement under paragraph (a) of this section must transmit to the Commandant (G–MHM) if requested the information specified in § 153.8(b).

§ 153.10 Equivalent standards.

(a) A vessel that cannot meet each standard required in this part for an endorsement on a Certificate of Inspection may meet an alternate standard if the Commandant finds that the alternate standard provides an equivalent or greater level of protection for the purpose of safety.

(b) The Commandant considers on a case by case basis the issuance of an equivalency to a standard required in this part if the person requesting the equivalency sends a written application to Commandant (G–MHM), U.S. Coast Guard, Washington, D.C. 20590, that includes—

(1) A detailed explanation of the vessel's characteristics that fail to meet the requirements of this part; and

(2) An explanation of how the substituted standards enable the vessel to approximate the level of safety offered by the standards of this part.

[1] Generally, the IMCO Certificate is sufficient for the Coast Guard to endorse the vessel's Letter of Compliance with the names of those cargoes in table I that are listed on the IMCO Certificate. In some cases the IMCO Certificate would not be sufficient, such as when the Certificate authorizes a cargo that is not permitted in U.S. waters, when the Certificate is in error or waives part of the Code, or when the regulations in this part exceed those of the Code.

TABLE 1.—*Table of minimum requirements*

Cargo identification	Cargo containment system [1]	Vent height [2]	Vent [3]	Gage [4]	Fire protection system [5]	Special requirements	Electrical hazard group and class [6]
Acetic acid	III	4 m	PV	Restricted	A	.238(a), .554	I–D
Acetic anhydride	II	4 m	PV	do	A	.238(a), .526, .554	I–D
Acetone cyanohydrin	II	B/3	PV	Closed	A	.238(a), .316, .336, .408, .525, .526, .912(b), .961, .1020, .1035.	
Acetonitrile	II	B/3	PV	Restricted	A	.336, .525, .526, .1020	I–D
Acrylic acid	III	4 m	PV	do	A	.238(a), .526, .912(a)	I–D
Acrylonitrile	II	B/3	PV	Closed	A	.236 (a), (c), (d), .316, .336, .408, .525, .526, .912(a), .1020.	I–D
Adiponitrile	III	4 m	PV	Restricted	A	.526	
Allyl alcohol	II	B/3	PV	Closed	A	.316, .336, .408, .525, .526, .961, .1020.	I–C
Allyl chloride	II	B/3	PV	do	A	.316, .336, .408, .525, .526, .1020.	I–D
Aminoethylethanolamine.	III	NR	Open	Open	A	.236 (a), (b), (c), (g)	
Ammonium hydroxide (28 pct or less NH_3).	III	4 m	PV	Restricted	C	.236 (b), (c), (f), .526	I–D
Aniline	II	B/3	PV	Closed	A	.316, .336, .408, .525, .526, .961, .1020.	
Benzene	III	B/3	PV	Restricted	B	.316, .336, .526	I–D
Benzyl chloride	II	B/3	PV	Closed	B	.316, .336, .408, .525, .526, .912(b), .1020.	
(Iso-, n-) butyl acrylate.	II	4 m	PV	Restricted	A	.526, .912(a)	I–D
(Iso-, n-, sec-, tert-) butylamine.	II	B/3	PV	Closed	A	.236 (b), (c), .336(a), .408, .525, .526, .1020.	
(N-) butyl ether	III	B/3	PV	do	A	.500, .525, .526, .1020, .1060.	
Butyl methacrylate	III	4 m	PV	Restricted	B	.526, .912(a)	
(Iso-, n-, crude) butyraldehyde.	III	4 m	PV	Open	A	.526	I–C
Camphor oil	III	4 m	PV	do	B	None	I–D
Carbolic oil	II	B/3	PV	Closed	A	.408, .525, .526, .961, .1020.	
Carbon disulphide	II	B/3	PV	do	C	.236(c), .267, .408, .500, .515, .520, .525, .526, .1020, .1040, 1060.	(7)
Carbon tetrachloride	III	B/3	PV	do		.316, .336, .408, .525, .526, .1020.	
Caustic potash solution.	III	NR	Open	Open		.236 (a), (c), (g), .961	
Caustic soda solution	III	NR	do	do		.236 (a), (c), (g), .961	
(Mono-) chlorobenzene	III	4 m	PV	Restricted	B	.526	I–D
Chloroform	III	B/3	PV	do		.525, .526, .1020	
(Crude) chlorohydrins	II	B/3	PV	Closed	A	.408, .525, .526, .1020	I–D
Chloroprene	II	B/3	PV	do	B	.316, .336, .525, .526, .912 (a), .1020.	
Chlorosulfonic acid	I	B/3	PV	do		.408, .525, .526, .554, .555, .961, .1000, .1020, .1045.	
Coal tar naphtha	III	4 m	PV	Restricted	A	.526	I–D
Creosote	III	NR	Open	Open	B	.408(a)(1)	
Cresols	III	NR	do	do	B	None	
Crotonaldehyde	II	B/3	PV	Restricted	A	.316, .336, .525, .526, .1020.	I–C
Cyclohexanone	III	4 m	PV	do	A	.236 (a), (b), .526	I–D
Cyclohexylamine	III	4 m	PV	do	A	.236 (a), (b), (c), (g), .526.	
(Iso-, n-) decyl acrylate.	III	NR	Open	Open	A, C	.236 (b), (c), .912(a)	
Dibutylamine	III	4 m	PV	Restricted	B	.236 (b), (c), .526	
Dichlorobenzene	III	4 m	PV	do	B	.236 (a), (b), .526	
1,1-Dichloroethane	III	4 m	PV	do	B	.526	
2,2'-Dichloroethyl ether.	II	4 m	PV	do	A	.236 (a), (b), .526	I–D
Dichloromethane	III	4 m	PV	do		.526	
1,1- or 1,2-dichloropropane.	II	B/3	PV	do	B	.526, .525, .1020	I–D
1,3-dichloropropene	II	B/3	PV	Closed	B	.316, .336, .408, .525, .526, .1020.	I–D
Diethanolamine	III	NR	Open	Open	A	.236 (b), (c)	
Diethylamine	III	B/3	PV	Restricted	A	.236 (a), (b), (c), (g), .525, .526, .1020.	I–C
Diethylenetriamine	III	NR	Open	Open	A	.236 (b), (c)	
Diethylethanolamine	III	4 m	PV	Restricted	A	.236 (a), (b), (c), (g), .526.	
Diisopropanolamine	III	NR	Open	Open	A	.236 (b), (c)	I–D
Diisopropylamine	II	B/3	PV	Closed	A	.236 (b), (c), .408, .525, .526, .1020.	I–C
Dimethylamine (40 pct or less).	III	B/3	PV	Restricted	A, C	.236 (a), (b), (c), (d), .525, .526, .1020.	I–C
Dimethylethanolamine.	III	4 m	PV	do	A	.236 (b), (c), .526	
Dimethylformamide	III	4 m	PV	do	A	.236 (b), .526	

Footnotes at end of table.

Cargo identification	Cargo containment system [1]	Vent height [2]	Vent [3]	Gage [4]	Fire protection system [5]	Special requirements	Electrical hazard group and class [6]
1,4-dioxane	II	B/3	PV	Closed	A	.408, .525, .526, .1020	I-C
Epichlorohydrin	II	B/3	PV	do	A	.316, .336, .408, .525, .526, .1020.	I-C
Ethanolamine	III	NR	Open	Open	A	.236 (b), (c), .526	
Ethyl acrylate	II	4 m	PV	Restricted	A	.526, .912(a)	I-D
Ethylenechlorohydrin	II	B/3	PV	Closed	A, C	.316, .336, .408, .525, .526, .961, .1020.	
Ethylene cyanohydrin	III	NR	Open	Open	A	None	I-D
Ethylenediamine	II	4 m	PV	Restricted	A	.236 (b), (c), .526	I-D
Ethylene dibromide	II	B/3	PV	Closed		.408, .525, .526, .1020	
Ethylene dichloride	II	4 m	PV	Restricted	B	.236(b), .408(a)(1), .526	I-D
Ethyl ether	II	4 m	PV	Closed	A	.236(g), .267, .408, .500, .515, .526, .1060.	I-C
2-ethylhexyl acrylate	III	NR	Open	Open	A	.912(a)	
Ethyl methacrylate	III	4 m	PV	Restricted	B	.912(a), .526	
2-ethyl-3-propyl acrolein.	III	4 m	PV	do	A	.526	
Formaldehyde solution (37 to 50 pct).	III	4 m	PV	do	A	.526	I-C
Formic acid	III	4 m	PV	do	A	.238(b), .526, .554	
Furfural	III	4 m	PV	do	A	.526	
Hydrochloric acid	III	4 m	PV	do		.267, .526, .554, .555, .557, .961, .1045, .1052.	
2-hydroxyethyl acrylate.	II	B/3	PV	Closed	A	.408, .525, .526, .912(a), .961, .1020.	
Isoprene	III	4 m	PV	Restricted	B	.912(a)	I-D
Mesityl oxide	III	4 m	PV	do	A	.408(a)(1), .526	I-D
Methyl acrylate	II	4 m	PV	do	B	.526, .912(a)	I-D
2-methyl-5-ethyl pyridine.	III	NR	Open	Open	A	.236(b)	
Methyl methacrylate	II	4 m	PV	Restricted	B	.526, .912(a)	I-D
(Alpha-) methyl styrene.	III	4 m	PV	do	B	.526, .912(a)	
Morpholine	III	4 m	PV	do	A	.236 (b), (c)	I-C
Motor fuel antiknock compounds (containing lead alkyls).	II	B/3	PV	Closed	B, C	.267, .336, .408, .525, .526, .961, .1020, .1025.	
Naphthalene (liquid)	III	4 m	PV	Restricted	B, C	None	
Nitric acid (70 pct or less).	II	4 m	PV	do		.408, .526, .554, .555, .961, .1045.	
(Mono-) nitrobenzene	II	B/3	PV	Closed	B, C	.316, 336, .408, .525, .961, .1020.	
1- or 2-nitropropane	III	4 m	PV	Restricted	A	.526, .600, .1055	I-C
(Ortho-, para-) nitrotoluene.	II	B/3	PV	Closed	B	.316, .336, .408, .525, .526, .1020.	
Oleum	II	B/3	PV	do		.316, .336, .408, .526, .554, .555, .556, .961, .1000, .1045, .1052.	
Paraldehyde	III	4 m	PV	Restricted	A	None	
Pentachloroethane	III	B/3	PV	do		.316, .336, .525, .526, .1020.	
Phenol	II	B/3	PV	Closed	A	.408, .525, .526, .961, .1020.	
Phosphoric acid	III	NR	Open	Open		.554, .555, .558, .1045, .1052.	
Phthalic anhydride (liquid).	III	4 m	PV	Restricted	D	None	
(Iso-, n-) propanolamine.	III	NR	Open	Open	A	.236 (b), (c), .526	
Propionic acid	III	4 m	PV	Restricted	A	.238(a), .554	I-D
Propionic anhydride	III	4 m	PV	do	A	.238(a), .526	
(Iso-, n-) propylamine	II	B/3	PV	Closed	C	.236 (b), (c), .408, .500, .525, .526, .1020, .1060.	I-D
Propylene oxide	II	4 m	PV	do	A	.500, .526, .530, .1010, .1011, .1060.	I-B
Pyridine	III	4 m	PV	Restricted	A	.236(b)	
Sodium hydrosulfide solution (45 pct or less).	III	4 m	PV	do		.526, .961	
Sodium hypochlorite solution (15 pct or less).	III	4 m	PV	do		.236 (a), (b)	
Styrene	III	4 m	PV	Open	B	.236(b), .912(a)	I-D
Sulfur (liquid)	III	NR	Open	do		.267, .526, .545	
Sulfuric acid	III	NR	do	do		.554, .555, .556, .961, .1000, .1043, .1045, .1052.	
1,1,2,2-tetrachloroethane.	III	B/3	PV	Restricted		.316, .336(a), .525, .526, .1020.	
Tetraethylenepentamine.	III	NR	Open	Open	A	.236 (b), (c)	
Tetrahydrofuran	III	4 m	PV	Restricted	A, D	.526, .912(b)	I-C
Toluene Diisocyanate	II	B/3	PV	Closed	C, D	.236(b), .316, .408, .500, .525, .526, .1000, .1020, .1060.	
Tricresyl phosphate (containing 1 pct or more of the ortho isomer).	II	4 m	PV	do	B	.408, .525(a), .1020	
Triethanolamine	III	NR	Open	Open	A	.236 (a), (b), (c), (g)	
Triethylamine	II	B/3	PV	Restricted	B	.236 (b), (a), .525, .526, .1020	I-C
Triethylenetetramine	III	NR	Open	Open	A	236 (a), (b), (c)	
Urea, ammonium nitrate solution (containing more than 2 pct NH_3).	III	4 m	PV	Restricted	A	.236(b), .526	I-D

Footnotes at end of table.

Cargo identification	Cargo containment system [1]	Vent height [2]	Vent [3]	Gage [4]	Fire protection system [5]	Special requirements	Electrical hazard group and class [7]
(Iso-, n-) valeraldehyde.	III	4 m	PV	do	A	.500, .526, .1060	I-C
Vinyl acetate	III	4 m	PV	Open	A	.912(a)	I-D
Vinylidene chloride	II	4 m	PV	Restricted	B	.236 (a), (h), .500, .526, .912 (a), .1060.	I-D
Vinyl ethyl ether	II	4 m	PV	Closed	A	.236 (b), (f), (g), .408, .500, .515, .526, .912(a), .1060.	
Vinyl toluene	III	4 m	PV	Restricted	B	.236 (a), (e), (g), .912(a)	I-D

[1] For details see secs. 153.230-153.232.
[2] For details see sec. 153.350.
[3] For details see sec. 153.355.
[4] For details see secs. 153.400-153.406.
[5] For details see sec. 153.460.
[6] For details see 46 CFR, 111.88-5.
[7] See sec. 153.520(b).

NOTES ON TABLE I

Cargo Containment System—the containment system type, either I, II, or III, is listed. See §§ 153.230 through 153.232.

Vent Heights—the location and height of the vent riser is described in terms of the vent height, either B/3 or 4 m. See § 153.350.

Vent—the type of venting control valve, either pressure vacuum (PV) or open, is listed. See § 153.355.

Gauge—the type of gauge, either closed, restricted (Restr.), or open, is listed. See §§ 153.400–153.406.

Fire Protection System—the type of fire protection system is shown, where—

A is a foam system for water soluble cargoes (alcohol foam), B is a foam system for water insoluble cargoes (regular foam), C is a water spray system, and D is a dry chemical system.

A dry chemical system may be used instead of an A, B, or C type system.

SPECIAL REQUIREMENT

The special requirements are shown by the digits of the section numbers, without the "153" part number preceding them.

ELECTRICAL HAZARD GROUP AND CLASS

This column is for use with subchapter J (Electrical Engineering) of this chapter.

NOTE.—See the appendix to this part for a list of cargoes to which neither this part nor subchapter D (Tank Vessels) of this chapter apply.

Subpart B—Requirements

GENERAL

§ 153.15 Requirements for U.S. flag vessel permits.

To have its Certificate of Inspection endorsed with the name of a cargo listed in table I, a U.S. flag vessel must meet the cargo's requiremens in this subpart.

§ 153.16 Requirements for foreign flag vessel permits.

To have its Letter of Compliance endorsed with the name of a cargo listed in table I, a foreign flag vessel must—

(a) Have an IMCO Certificate endorsed with the name of the cargo and meet any specific requirements in this subpart that the Commandant (G-MHM) may prescribe; or

(b) Meet the requirements of this subpart and § 30.01-1(e) of this chapter.

HULL TYPE CALCULATIONS

§ 153.20 Type I hull calculations.

Calculations for a type I hull must show that it can survive damage as described in §§ 153.32 and 153.34 at any location.

§ 153.21 Type II hull calculations.

(a) Calculations for a type II hull 150 m (approx. 492 ft) or less in length must show that it can survive damage as described in §§ 153.32 and 153.34 at any location except the transverse bulkheads bounding an aft machinery space.

(b) Calculations for a type II hull greater than 150 m (approx 492 ft) in length must show that it can survive damage as described in §§ 153.32 and 153.34 at any location.

§ 153.22 Type III hull calculations.

(a) Calculations for a type III hull less than 125 m (approx. 410 ft) in length must show that it can survive damage as described in §§ 153.32 and 153.34 at any location except an aft machinery space.

(b) Calculations for a type III hull 125 m (approx. 410 ft) or greater in length must show that it can survive damage as described in §§ 153.32 and 153.34 at any location except the transverse bulkheads bounding an aft machinery space.

§ 153.30 Permeability of spaces.

(a) Calculations in which a machinery space is treated as a floodable compartment must be based on an assumed machinery space permeability of 0.85 unless the use of an assumed permeability of less than 0.85 is justified in detail.

(b) The assumed permeability of a flooded space other than a machinery space must be either—

(1) The more disabling of 0.95 or 0.0; or

(2) Based on specific cargo, fuel, or ballast loadings included in the information required under § 153.806(b).

§ 153.32 Damage.

(a) Calculations must assume both collision and grounding damage, separately; and the damage must consist of the most disabling penetration up to and including penetrations having the following dimensions:

(1) *Collision penetration.*

(i) Longitudinal extent: (1/3)L 2/3 or 14.5 m (approx. 0.495L 2/3 or 47.6 feet), whichever is less.

(ii) Transverse extent (inboard from the ship's side at right angles to the centerline at the level of the loadline assigned under subchapter E): B/5 or 11.5 m (approx. 37.7 feet), whichever is less.

(iii) Vertical extent: from the base line upwards without limits.

(2) *Grounding penetration.*

	At the forward end but excluding any damage aft of a point 0.3 L aft of forward perpendicular	At any longitudinal position
(i) Longitudinal.	L/10	L/10 or 5 m (approximately 16.4 ft) whichever is less.
(ii) Transverse	B/6 or 10 m (approximately 32.8 ft), whichever is less.	5 m (approximately 16.4 ft).
(iii) Vertical extent from the baseline.	B/15 or 6 m (approximately 20 ft), whichever is less.	B/15 or 6 m (approximately 20 ft), whichever is less.

(b) If the damage assumption excludes a transverse bulkhead bounding a machinery space, the machinery space must be assumed to be damaged as a case separate from the damage assumption.

§ 153.34 Survival.

A tankship is presumed to survive if it meets the following conditions:

(a) *Heel angle.* (1) In the flinal condition of flooding the angle of heel must not exceed 15° (17° if no part of the freeboard deck is immersed).

(2) However, the Commandant (G-MMT) considers on a case by case basis vessels 150 m or less in length having heel angles greater than 17° but less than 25°.

(b) *Range of stability.* A tankship must have a positive metacentric height throughout the intermediate stages of flooding and—

(1) A positive righting lever for at least 20° beyond the angle of equilibrium;

(2) No unprotected openings for at least 20° beyond the angle of equilibrium; and

(3) A maximum residual righting lever of at least 10 cm (approx. 4 in.) in the final condition of flooding.

(c) *Final waterline.* The final waterline, taking into account sinkage, heel, and trim, must be below any opening through which progressive flooding may take place. A watertight superstructure beyond the extent of damage adds to the stability of the tankship if it is separated from the damage space by a watertight bulkhead.

§ 153.35 Loadline requirements.

A vessel that meets §§ 153.20, 153.21, or 153.22 also meets § 42.20–5 of this chapter.

GENERAL VESSEL ARRANGEMENTS

153.200 Hosetightness of deckhouse portlights, wheelhouse windows, and wheelhouse doors.

Unless they are located on the after bulkhead or on the outboard side of the house and the greater of L/25 or 3 m (approx. 10 ft) aft of its forward bulkhead—

(a) Accommodations deckhouse portlights must be fixed; and

(b) Wheelhouse windows that are not fixed and wheelhouse doors must have the dogs and gaskets necessary to make them hosetight.

§ 153.202 Location of deckhouse doors and airports.

Each deckhouse door or airport leading to an accommodations space must be on the aft or outboard side of the deckhouse and at least L/25 but no less than 3 m (approx. 10 ft) aft of the forward bulkhead of the deckhouse.

§ 153.208 Ballast equipment.

(a) Except for the arrangement described in paragraph (b) of this section, no piping that serves a dedicated ballast tank that is adjacent to a cargo tank may enter an engine room or accommodation space.

(b) Piping used only to fill a dedicated ballast tank adjacent to a cargo tank may enter an engine room or accommodation space if the piping has—

(1) A valve that can be operated from the weatherdeck; and

(2) A non-return valve at the point it enters the ballast tank.

(c) Piping, pumps and vent lines serving a dedicated ballast tank may not be located within a cargo containment system.

§ 153.209 Bilge pumping systems.

Bilge pumping systems for cargo pumprooms, slop tanks, and void spaces separated from cargo tanks by only a single bulkhead must be entirely within the locations allowed containment systems in § 153.234.

§ 153.214 Personnel emergency and safety equipment.

Each tankship must have—

(a) Two stretchers or wire baskets complete with equipment for lifting an injured person from a pumproom or a cargo tank;

(b) In addition to any equipment required by Regulation 25, Chapter II, SOLAS 1960, three each of the following:

(1) A 30 minute self-contained breathing apparatus with five refill tanks or cartridges of 30 minutes capacity each;

(2) A large rubber apron, rubber boots, long sleeved rubber gloves, and goggles;

(3) A steel-cored lifeline with harness; and

(4) An explosion-proof lamp;

(c) One set of the equipment required in paragraph (a) of this section and two sets of that required in paragraph (b) of this section stowed in a locker adjacent to the emergency shutdown station required in § 153.296(b), and the remaining equipment of paragraphs (a) and (b) of this section stowed in a locker adjacent to the second emergency shutdown station of § 153.296, both lockers marked as described in § 153.952 (c), (d), and (e) with the legend "SAFETY EQUIPMENT";

(d) A first aid kit;

(e) An oxygen resuscitator; and

(f) A shower and an eye wash fountain that are—

(1) Located on the weatherdeck; and

(2) Marked "EMERGENCY SHOWER" as described in § 153.952 (c), (d), and (e) so that the legend is visible from all work areas of the cargo deck forward of the accommodations deckhouse.

CARGO CONTAINMENT SYSTEM

§ 153.230 Type I system.

A type I containment system must meet the following requirements:

(a) It must be in a type I hull.

(b) Except as described in § 153.235—

(1) It may be no closer to the tankship's shell than 76 cm (approx. 30 in.);

(2) It may not be located in any part of the tankship subject to the damage described in §§ 153.32(a)(1)(ii) and 153.32(a)(2)(iii).

§ 153.231 Type II system.

A type II containment system must meet the following requirements:

(a) It must be in at least a type II hull.

(b) Except as described in § 153.235—

(1) It may be no closer to the tankship's shell than 76 cm (approx. 30 in.);

(2) It may not be located in any part of the tankship subject to the damage described in § 153.32(a)(2)(iii).

§ 153.232 Type III system.

A type III containment system must be in at least a type III hull.

§ 153.234 Fore and aft location.

(a) Each cargo containment system and any compartments within which a containment system is located must be forward of a tankship's accommodation spaces.

(b) Except as described in § 153.235, each cargo containment system must be located at least 0.05L aft of the forward perpendicular, but in no case forward of a collision bulkhead.

§ 153.235 Exceptions to cargo piping location restrictions.

Cargo piping may be located in those areas from which a containment system is excluded by §§ 153.230(c), 153.231(c), and 153.234(b) if the cargo piping—

(a) Drains back to the cargo tank;

(b) Enters the tank above the level at which a venting system is required to terminate by § 153.354; and

(c) Rises above the tank a height at least 10% in excess of that which would be reached by a column of the least dense cargo for which the tank is certificated when supported by a pressure equal to the vent system's relief valve setting.

§ 153.236 Prohibited materials.

When a paragraph of this section is referenced in Table I, the materials listed in that paragraph may not be used in components that contact the cargo liquid or vapor.

(a) Aluminum or aluminum alloys;

(b) Copper or copper alloys;

(c) Zinc or galvanized steel;

(d) Magnesium;

(e) Lead;

(f) Silver or silver alloys;

(g) Mercury.

§ 153.238 Required materials.

When a paragraph of this section is referenced in Table I, only those materials listed in that paragraph may be used in components that contact the cargo liquid or vapor.

(a) Aluminum, stainless steel, or steel covered with a protective lining or coating.

(b) (1) With cargo concentrations of 98% or greater, aluminum or stainless steel.

(2) With cargo concentrations of less than 98%, 304L or 316 stainless steel.

§ 153.239 Cast iron prohibited.

No gray cast iron may be used in a cargo containment system.

§ 153.240 Insulation.

Cargo containment system insulation made necessary by the requirements of this part must meet the requirements in § 38.05–20 of this chapter. However, the vapor barrier required by § 38.05–20(b) is unnecessary if the insulation is—

(a) Protected from the weather, and in excess of 46° C (approx. 115° F); or

(b) In an atmosphere whose dewpoint is less than the temperature of any surface in contact with the insulation.

TANKS

§ 153.250 Double-bottom and deep tanks as cargo tanks.

Except in those cases in which Commandant (G–MHM) specifically approves a double-bottom or deep tank as a cargo tank, an integral cargo tank or the hold within which an independent cargo tank is located must extend to the weatherdeck.

§ 153.251 Independent cargo tanks.

(a) An independent cargo tank must meet § 38.05–10(a)(1), (b), (d), and (e)(1) of this chapter, regardless of whether the tank is endorsed to carry a cargo requiring an independent tank.

(b) A tank endorsed to carry a cargo requiring an independent cargo tank must meet §§ 38.05–2(d) and 38.05–4(g) of this chapter.

§ 153.252 Use of spill valves.

A cargo tank with a spill valve must have a remotely actuated quick closing shutoff valve in its fill line.

§ 153.254 Tank access.

(a) A cargo tank must have at least one covered manhole opening into the vapor space described in § 153.354.

(b) An access through a vertical tank surface must be at least 60 c. . by 80 cm (approx. 24 by 31 in.) and no more than 60 cm above a foothold, grating, or surface on both sides of the access way.

(c) An access through a horizontal tank surface must be at least 60 cm by 60 cm (approx. 24 by 24 in.).

(d) An access trunk may be no less than 76 cm (approx. 30 in.) in diameter.

§ 153.256 Trunks, domes, and openings of cargo tanks.

(a) The hatch of a cargo tank must—

(1) Be at the highest point of the tank; and

(2) Open on or above the weatherdeck.

(b) To be endorsed to carry a cargo requiring an independent cargo tank, a tank must have—

(1) A trunk or dome at the uppermost part of the tank, extending above the weatherdeck;

(2) Its hatch at the top of the trunk or dome; and

(3) No openings below the weatherdeck.

§ 153.258 Tank separation.

Each cago tank must be separated from machinery spaces, service spaces, accommodation spaces, and areas designed to store potable, domestic, and feed water or edibles by two bulkheads at least 76 cm (approx. 30 in) apart, such as a cofferdam, cargo pumproom, or tank not carrying a cargo listed in this part.[2]

§ 153.263 Pressure vacuum gauge.

Each tank that carries at ambient temperature a cargo whose vapor pressure exceeds 1.033 kp/cm² absolute at 37.3° C (approx. 14.7 psia at 100° F) must have a tank pressure-vacuum gauge where cargo transfer is controlled.

§ 153.266 Tank linings.

A tank lining must be—

(a) At least as elastic as the tank material; and

(b) Applied or attached to the tank as recommended by the lining manufacturer.

§ 153.267 Special requirement for an independent cargo tank.

When table I refers to this section, the cargo tank must be an independent tank.

CARGO HANDLING EQUIPMENT

§ 153.280 Cargo transfer valving.

A cargo transfer system must have—

(a) A manually operated stop valve at each connection between the cargo piping system and a cargo hose;

(b) A manual stop valve, operable from the weatherdeck, on each cargo filling line where it enters the cargo tank;

(c) Either an intank cargo pump or a manually operated stop valve in the tank discharge line where it passes through the tank wall.

§ 153.281 Alternate cargo line valving for tanks adjacent to pumprooms.

The stop valve required by § 153.280(b) may be placed in the cargo pumproom rather than at the cargo tank if—

(a) The pumproom is adjacent to the cargo tank;

(b) The cargo pump for the tank is in the pumproom;

(c) The tank's fill line connects to the cargo pump; and

(d) The tank's fill line has a second stop value between the stop valve required by § 153.280(b) and the cargo pump.

§ 153.282 Piping system design.

Each cargo piping system must meet the standards of part 56 and §§ 38.10–1(b), 38.10–1(e), and 38.10–10(a) of this chapter.

§ 153.284 Piping point of entry to ship's spaces.

(a) A piping system may enter an independent cargo tank only through that part of the trunk or dome extending above the weatherdeck.

(b) A cargo piping system may enter an integral tank beneath the weatherdeck only if the cargo piping system has a stop valve inside the tank in which it terminates, operable from the weatherdeck.

(c) When cargo lines serving different tanks enter a pumproom and connect to a single pump, each cargo line must have a stop valve between the pumproom bulkhead and the point in the pumproom at which it joins the pump and the other cargo lines.

(d) A cargo piping system may enter no machinery space but a cargo pumproom.

§ 153.286 Cargo piping joints.

Nonwelded cargo piping system joints are considered by the Commandant (G-MMT) on a case by case basis.

§ 153.288 Filling lines.

The discharge point of a cargo tank filling line must be no higher above the bottom of the cargo tank or sump than the greater of 10 cm (approx. 4 in.) or the radius of the filling line.

§ 153.290 Quick closing valve operation.

Remotely actuated quick closing shutoff valves required by this part must—

(a) Be of the fail-closed type, that is, they must close on loss of power; and

(b) Allow manual operation.

§ 153.292 Quick closing valve operating time.

Remotely actuated quick closing shutoff valves required by this part must operate from fully open to fully closed in no more than thirty seconds.

§ 153.294 Marking of piping systems.

(a) The tank a cargo piping system serves must be marked on each cargo piping system in characters at least 5 cm (approx. 2 in.) high.

(b) Every hose connection of a cargo piping system must be permanently marked with the cargo piping system's working pressure required by § 38.10–10(a) of this chapter.[3]

§ 153.296 Emergency shutdown stations.

(a) Each tankship must have at least two emergency shutdown stations.

(b) One emergency shutdown station must be located at the after edge of that part of the weatherdeck covering the cargo tanks.

(c) One emergency shutdown station must be accessible when a break in a cargo piping system or hose causes spraying or leaking.

(d) Each emergency shutdown station must contain a single remote actuator for all quick closing shutoff valves required by this part.

(e) Each emergency shutdown station must have the controls necessary to stop all cargo pumps on the tankship.

(f) Each emergency shutdown station must be marked as described in § 153.952 (c), (d), and (e) with the legend "EMERGENCY SHUTDOWN STATION" so that the legend is visible from work areas in that part of the deck above the cargo tanks.

CARGO HANDLING SPACE VENTILATION

§ 153.310 Ventilation system type.

A cargo handling space must have a permanent forced ventilation system of the exhaust type.

§ 153.312 Ventilation system standards.

(a) A ventilation system exhaust duct must discharge no less than 10 m (approx. 32.8 ft) from ventilation intakes, accommodation spaces, and working spaces.

(b) A ventilation system may not recycle vapors from ventilation discharges.

(c) Except for the space served by the ventilation duct, a ventilation duct may not pass through a machinery room, an accommodation space, or working spaces.

(d) A ventilation system must be operable from outside the space it ventilates.

(e) A ventilation system must be sized to change the air in the cargo handling space at least 30 times per hour.

(f) A ventilation system must not allow air to stagnate in any part of a ventilated space.

(g) A ventilation system must be able to exhaust air from both above and below the deck plates of a ventilated space.

§ 153.314 Ventilation of spaces not usually occupied.

(a) Each tankship must have portable ventilation equipment that fits the mount required in paragraph (b)(1) of this section.

(b) Each cofferdam, duct keel, pipe tunnel, and cargo tank hold must have—

(1) A mount for the portable mechanical ventilation equipment required by this section; and

[2] See § 153.234. See also § 32.60–10 of this chapter for limitations on the stowage of combustible liquids adjacent to ignition sources.

[3] See § 153.282 of this part.

(2) Either permanent ventilation ductwork connected to the mount and arranged to supply air to the extremities of the space, or

(3) An attachment for temporary ductwork at the mount with enough ductway in the ventilated space and temporary ductwork stowed aboard the vessel to supply air to the extremities of the space.

§ 153.316 Special pumproom ventilation rate.

When Table I refers to this section, the pumproom ventilation system must change the air in the pumproom 45 times per hour and discharge no less than 4 m (approx. 13.1 ft) above the deck.

CARGO PUMPROOMS

§ 153.330 Access.

(a) The access door to a pumproom must open on the weatherdeck.

(b) A pumproom ladder must meet American National Standards Institute standard A 14.3 (1956).

(c) The access way to a pumproom and its valving must allow passage of a man wearing the breathing apparatus required by § 153.214(b)(1).

(d) No ladderway in a pumproom may be obstructed by piping, framework, or other equipment.

(e) Pumproom ladders and pumproom platforms must have guard railings.

(f) No ladder to a pumproom may have an incline from the horizontal exceeding 60°.

§ 153.332 Hoisting arrangement.

(a) A pumproom located below the weatherdeck must have a permanent hoisting arrangement with a lifting capacity of 250 kg (approx. 550 lbs), operable from the weatherdeck, for the removal of an unconscious person.

(b) The pumproom must have a 60 cm by 60 cm (approx. 2 ft by 2 ft) cross-sectional clearance through the hoistway.

§ 153.333 Cargo pump discharge pressure gauge.

Each cargo pump within a pumproom must have a discharge pressure gauge outside the pumproom.

§ 153.334 Bilge pumping systems.

(a) A cargo pumproom must have a bilge pumping system.

(b) The bilge pumping system must have—

(1) Complete remote operating controls outside the pumproom, and

(2) An alarm that operates when the depth of bilges exceeds 50 cm (approx. 20 in.).

§ 153.336 Special pumproom location requirements.

When Table I refers to this section—

(a) The cargo pump must be an intank cargo pump,

(b) The cargo pumproom must be on or above the weatherdeck, or

(c) The cargo pumproom must have the specific approval of the Commandant (G-MHM).

CARGO VENTING SYSTEMS

§ 153.350 B/3 and 4 m vent heights.

(a) A B/3 venting system must discharge—

(1) At the greatest of the following heights:

(i) 6 m (approx. 20 ft) above the weatherdeck

(ii) B/3 above the weatherdeck

(iii) 6 m (approx. 20 ft) above any walkway that extends to within 6m (approx. 20 ft) of a line through the vent discharge and perpendicular to the deck; and

(2) At least 15 m (approx. 49 ft) from air intakes for, or openings into, accommodation and service spaces.

(b) A 4m venting system must discharge at least—

(1) 4 m (approx. 13.1 ft) above the higher of—

(i) The weatherdeck; or

(ii) Any walkway that extends to within 4 m (approx. 13 ft) of a line through the vent discharge and perpendicular to the deck; and

(2) 10 m (approx. 32.8 ft) from—

(i) An air intake for an accommodation or service space; and

(ii) An opening to an accommodation or service space.

§ 153.352 B/3 and 4 m venting system outlets.

A B/3 or 4 m venting system outlet must—

(a) Discharge vertically upwards; and

(b) Prevent precipitation from entering the vent system.

§ 153.353 High velocity vents.

The Commandant (G-MHM) considers on a case by case basis reductions in the 4 m or B/3 vent height requirements with the use of high velocity variable orifice vent outlets.

§ 153.354 Venting system inlet.

A venting system must terminate in the vapor space above the cargo when the tank is filled to a 2% ullage and the tankship has no heel or trim.

§ 153.355 PV venting systems.

When Table I requires a PV venting system, the cargo tank must have a PV valve in its vent line. The PV valve must be located between the tank and any connection to another tank's vent line (such as at a vent riser common to two tanks).

§ 153.358 Venting system flow capacity.

(a) The cross-sectional flow area of any vent system segment, including any PV or SR valve, may at no point be less than that of a pipe whose inside diameter is 6.4 cm (approx. 2½ in.).

(b) When Table I requires a closed or restricted gauging system, calculations must show that, under conditions in which a saturated cargo vapor is discharged through the venting system at the maximum anticipated loading rate, the pressure differential between the cargo tank vapor space and the atmosphere does not exceed 0.281 kp/cm² gauge (approx. 4 psig), or, for independent tanks, the maximum working pressure of the tank.

§ 153.360 Venting system restriction.

A venting system may have no assembly that could reduce its cross-sectional flow area or flow capacity to less than that required in § 153.358.

§ 153.362 Vent system drain.

Each vent system must have a drain valve at the lowest point in the system.

§ 153.364 Vent system supports.

Supports for a vent system must meet § 38.10(c) of this chapter.

§ 153.366 Spill valves.

A spill valve—

(a) Must discharge into a container of at least 0.6 m³ (approx. 4 barrels) capacity at any heel or trim allowed in the stability manual required by § 153.806;

(b) May not discharge into the waterway; and

(c) Must meet Subpart 162.017 of this chapter.

§ 153.368 Pressure vacuum valves.

(a) The pressure side of a required pressure vacuum relief valve must relieve only at a pressure exceeding 0.035 kp/cm² gauge (approx. 0.5 psig).

(b) A pressure vacuum relief valve must meet the requirements of subpart 162.017 of this chapter.

§ 153.370 Minimum RVS for ambient temperature carriage.

The RVS for a containment system that carries a cargo at ambient temperature must at least equal the cargo's vapor pressure at 46° C (approx. 115° F).

§ 153.371 Minimum RVS for refrigerated carriage.

A refrigerated cargo tank must have its RVS at least equal to the lesser of—

(a) That in § 153.370; or

(b) 110 percent of the cargo's vapor pressure at the steady state temperature obtained by a full tank of cargo with the refrigeration system operating under ambient conditions described within the definition of a refrigerated tank in § 153.2(x).

§ 153.372 Vapor return connection for vapor pressures exceeding one atmosphere.

A vent system for a containment system that carries at ambient temperature a cargo whose vapor pressure exceeds 1.033 kp/cm² absolute at 37.8° C (approx. 14.7 psia at 100° F) must have a vapor return connection.

CARGO GAUGING SYSTEMS

§ 153.400 Gauges.

(a) A sounding tube—

(1) May not be installed on a tank whose RVS exceeds 0.281 kp/cm² gauge (approx. 5 psig); and

(2) Must have a cover that seals the opening when in place.

(b) Columnar gauge glasses may not be used.

(c) Flat sight glasses must meet § 38.-10-20(h) of this chapter.

§ 153.404 Containment systems requiring closed gauges.

When table I requires a cargo's containment system to have a closed gauge, the containment system must have—

(a) A vapor return connection;

(b) Either a closed cargo sampling system or cargo sampling arrangement allowing the retrieval of a sample through an orifice not exceeding—

(1) 0.635 cm (approx. 0.25 in.) diameter when the cargo's vapor pressure is 0.281 kp/cm² gauge (approx. 4 psig) or less; or

(2) 0.140 cm (approx. 0.055 in.) diameter when the cargo's vapor pressure exceeds 0.281 kp/cm² gauge (approx. 4 psig);

(c) Separate audible and visual high level alarms that—

(1) Signal when the tank is filled beyond 97% of its capacity; and

(2) Can be seen adn heard where cargo transfer is controlled and on the open deck; and

(d) A permanently installed closed gauging system.

§ 153.406 Containment systems requiring restricted gauges.

When table I requires a cargo's containment system to have a restricted gauge, the containment system must have—

(a) A restricted gauging system with—

(1) An orifice diameter not exceeding 5 cm (approx. 2 in.) when the cargo tank's RVS is 0.281 kp/cm² gauge (approx. 4 psig) or less, and

(2) An orifice diameter not exceeding 0.140 cm (approx. 0.055 n.) when the cargo tank's RVS exceeds 0.281 kp/cm² gauge (approx. 4 psig); and

(b) A venting system having one of the following:

(1) Only lock open PV valves,

(2) A valved bypass around a PV valve, or

(3) An RVS exceeding 0.281 kp/cm² gauge (approx. 4 psig).

§ 153.407 Restricted gauging system covers.

A restricted gauging system must have a permanently attached cover that is vapor tight when in place.

§ 153.408 Tank overfill controls.

(a) When Table I refers to this section, a cargo containment system must have—

(1) A cargo high level alarm system that meets § 153.404(c) and whose operation can be checked before each loading;

(2) A tank overfill control system that automatically closes the filling line when the tank is filled beyond 98% of its capacity; and

(3) A continuous tank cargo level indicator.

(b) The high level alarm system must be completely independent of the overfill control system.

(c) Each high level alarm must be marked as described in § 153.952(c), (d) and (e) with the legend "TANK OVERFILL ALARM" so that the legend is visible from work areas of the cargo deck forward of the accommodations deckhouse.

CARGO TEMPERATURE CONTROL SYSTEMS

§ 153.430 Heat transfer systems; general.

Each cargo cooling system required by this part and each cargo heating system must—

(a) Meet the standards of Subchapters F (Marine Engineering and J (Electrical Engineering) of this chapter;

(b) Have valving that enables the system to be isolated from any other heat transfer system; and

(c) Allow manual regulation of the system's heat transfer rate.

§ 153.432 Cooling systems.

(a) Each cooling system required by this part must control temperature automatically.

(b) Each component of a required automatic cooling system that has powered parts, such as a motor, compressor, pump, valve operator, or fan, must have an equivalent standby part that can be placed in operation immediately after an equipment failure.

§ 153.434 Heat transfer coils within a tank.

A cargo cooling or heating system having coils within a tank must keep the heat transfer fluid at a pressure greater than that of the cargo.

§ 153.436 Heat transfer fluid.

A heat transfer fluid must have the approval of the Commandant (G-MHM) for use with each particular cargo.

§ 153.438 Cargo temperature alarms required.

(a) Each refrigerated tank must have either an alarm that operates when the cargo's pressure exceeds the vapor pressure described in § 153.371(b) or an alarm that operates when the cargo's temperature exceeds the steady state temperature described in § 153.371(b).

(b) The alarm must give an audible and visual signal on the bridge and at the cargo control station.

(c) The cargo pressure or temperature alarm must be independent of other cargo pressure or temperature sensing arrangements.

§ 153.440 Cargo temperature sensors required.

(a) Each elevated temperature or refrigerated cargo tank must have at least two remote reading temperature sensors within the cargo space at the bottom of the tank.

(b) A refrigerated cargo tank must have a third sensor in the vapor space of the tank.

(c) A readout for each temperature sensor required by this section must be at the point where cargo transfer is controlled.

SPECIAL REQUIREMENTS FOR FLAMMABLE OR COMBUSTIBLE CARGOES

§ 153.460 Fire protection systems.

(a) With the exception of the vent riser, each part of a cargo containment system exposed on the weatherdeck must be covered by either a dry chemical fire protection system or an alternate system listed beside the cargo in Table I and described in the footnotes to Table I.

(b) A fire protection system required by this part must meet Part 34 of this chapter.

§ 153.461 Electrical bonding of independent tanks.

An independent metallic cargo tank that carries a flammable or combustible cargo must be electrically bonded to the tankship's hull.

§ 153.462 Inert gas systems.

An inert gas system on a tank that carries a flammable or combustible cargo must not create static arcing as the inert gas is injected into the tank.

§ 153.463 Vent system discharges.

The discharge from a vent system on a tank carrying a flammable or combustible cargo must be at least 10 m (approx. 32.8 ft) from any ignition source.

§ 153.464 Fusible elements.

Each remotely actuated quick closing shutoff valve on a containment system that carries a flammable or combustible cargo must have a fusible element that melts at less than 104° C (approx. 220° F) and closes the valve.

§ 153.465 Flammable vapor detector.

A tankship that carries a flammable cargo must have two portable vapor detectors that meet § 35.30-15(b) of this chapter.

SPECIAL REQUIREMENTS

When Table I refers to this section, a cargo containment system must have a permanent inert gas system that—

§ 153.500 Inert gas systems.

(a) Maintains the vapor space of the containment system in an inert state by filling the vapor space with a gas that is neither reactive with the cargo nor flammable;

(b) Maintains at least a 0.141 kp/cm² gauge (approx. 2 psig) pressure of gas within the containment system continuously;

(c) Has storage for enough inerting gas to replace that normally lost while the tank's atmosphere is maintained in an inert condition (e.g. through tank breathing and relief valve leakage) but in no case an amount less than 5 percent of the tank's capacity; and

(d) Has the capacity to supply gas at 1.5 times the volumetric cargo discharge rate.

§ 153.501 Requirement for dry inert gas.

When Table I refers to this section, an inert gas system for the containment system must supply inert gas containing no more than 100 ppm water.

§ 153.515 Special requirements for extremely flammable cargoes.

When table I refers to this section—

(a) An enclosed space containing a cargo tank must have an inerting system that meets the requirements in § 153.500 that apply to the inert gas system of a containment system, and

(b) A cargo containment system must have—

(1) Only a cargo discharge pump that avoids liquid pressure against the shaft gland or that is submerged; and

(2) The cargo tank's RVS at 0.211 kp/cm² gauge (approx. 3 psig) or greater.

§ 153.520 Special requirements for carbon disulphide.

A containment system carrying carbon disulphide must meet the following:

(a) Each cargo pump must be of the intank type and encased within a cylindrical well that extends from the top of the tank to a point no more than 10 cm (approx. 4 in.) above the bottom of the tank.

(b) A tankship must have no

(1) Electrical equipment; or

(2) Equipment that may exceed a temperature of 80° C (approx. 175° F)

where the use of electrical equipment is restricted by § 111.85–10 of this chapter.

(c) The cargo piping and venting systems must be completely independent of those for other cargo.

(d) Pressure relief valves must be made of stainless steel.

§ 153.525 Special requirements for unusually toxic cargoes.

When Table I refers to this section a containment system must meet the following:

(a) The cargo piping system must be completely separate from any containment system carrying a cargo not covered by this section.

(b) A cargo tank's RVS must be no less than .211 kp/cm² guage (approx. 3 psig).

(c) All cargo pumps and valves located below the weatherdeck must be operable from the weatherdeck.

(d) A heat transfer system for the cargo may not enter the engine room and must be either—

(1) Independent of any other system; or

(2) Totally external to the cargo containment system.

(e) A cargo containment system must be separated from bunkers by at least two bulkheads.

(f) A cargo tank's venting system must have a vapor return connection.

§ 153.526 Toxic vapor detectors.

When Table I refers to this section, a tankship must have two toxic vapor detectors, at least one of which must be portable, each able to measure the threshold limit value (TLV) vapor concentration of the cargo. These vapor detectors may be combined with those required by § 153.465.

§ 153.527 Toxic vapor protection.

When Table I refers to this section, a tankship must have on board for each crewmember a respiratory protective device having a service life of 5 minutes at cargo concentrations of ten times the cargo's TLV.

§ 153.530 Special requirements for alkylene oxides.

When Table I refers to this section, a containment system must meet the following:

(a) The tank's RVS must not be less than .211 kp/cm² gauge (approx. 3 psig).

(b) A cooling system—

(1) May not compress the cargo;

(2) Must regulate the cargo temperature automatically and allow manual regulation; and

(3) Must maintain the cargo temperature below 40°C (approx. 104°F).

(c) The cargo piping system must—

(1) Comply with part 38 of this chapter;

(2) Be completely separate from all other systems; and

(3) Be assembled from valves, fittings, and accessories having a pressure rating of 10.5 kp/cm² gauge (approx. 150 psig) (American National Standards Institute) or greater.

(d) Valve disks or disk faces, seats, and other wearing valve parts must be made of stainless steel containing no less than 11 percent chromium.

(e) The venting system must be entirely separate from other containment or tankship systems.

(f) When a cargo tank is in an enclosed space, the space must be fitted—

(1) With an inert gas system meeting the requirements that apply to the inert gas system of a containment system in § 153.500; or

(2) With a forced ventilation system meeting the requirements that apply to a cargo handling space ventilation system in § 153.312.

(g) Cofferdams, cargo tanks, double bottom spaces, and other enclosed spaces adjacent to an integral cargo tank must have an inert gas system meeting the requirements that apply to the inert gas system of a containment system in § 153.500.

(h) All ventilation machinery must be of non-sparking construction as defined in § 110.15–175(1) of this chapter.

(i) The cargo may be discharged only by an intank pump or inert gas displacement.

(j) The cargo piping system's hose connection must have a remotely actuated quick closing shutoff valve.

(k) Cargo hose must—

(1) Have a specific approval of the Commandant (G–MMT) for use in alkylene oxide transfer; and

(2) Be marked "For Alkylene Oxide Transfer Only".

(l) All exposed parts of the cargo containment system above or on the deck, such as tank domes, cargo piping, and loading manifolds, must be covered by a water spray system that—

(1) Operates automatically in a fire involving the cargo containment system;

(2) Has at least two remote manual actuators, one in each emergency shutdown station required by § 153.296; and

(3) Covers the area of application with a uniform spray of 0.175 l/m² sec (0.0043 gal/ft² sec).

§ 153.545 Special requirements for liquid sulfur.

(a) A containment system carrying liquid sulfur must have—

(1) A cargo tank ventilation system that—

(i) Maintains the H_2S vapor concentration below 1.85% by volume; and

(ii) Prevents sulfur buildup within itself; and

(2) An alarm system designed to operate when the ventilation system blower fails.

(b) The void spaces around a cargo tank that carries liquid sulfur must be oil tight.

(c) A cargo tank that carries liquid sulfur and the void spaces surrounding the tank must have connections through which vapor may be sampled.

§ 153.554 Special requirements for acids.

When Table I refers to this section—

(a) Each containment system loading or discharge connection must have a spray shield;

(b) A cargo containment system must be separated from bunkers by double walls, such as a cofferdam and piping tunnels; and

(c) A vessel must have on board a means to determine whether cargo has leaked into a space.

§ 153.555 Special requirements for inorganic acids.

When Table I refers to this section—

(a) A tankship's shell plating may not be in the boundary of any part of the cargo tank; and

(b) An enclosed compartment containing or a compartment adjacent to a cargo tank may have no electrical equipment.

§ 153.556 Special requirements for sulfuric acid and oleum.

(a) A containment system for the carriage of sulfuric acid may be—

(1) Made of unlined steel if the cargo composition is between 70 and 80 or between 90 and 100 percent acid by weight;

(2) Lined with lead if the cargo composition does not exceed 96 percent acid by weight; or

(3) Lined with rubber if the cargo composition does not exceed 51 percent acid by weight.

(b) A containment system for oleum may be of unlined steel if the concentration of free sulfur trioxide in the oleum exceeds 4 percent by weight.

(c) Containment systems for the carriage of contaminated sulfuric acid or of oleum or sulfuric acid at concentrations differing from those specified in this section or of materials different from those specified to this section are considered by

the Commandant (G–MHM) on a case by case basis.

§ 153.557 Special requirements for hydrochloric acid.

(a) A containment system that carries hydrochloric acid must be lined with—

(1) Rubber; or

(2) A material approved for hydrochloric acid tanks by the Commandant (G–MHM).

(b) Containment systems for contaminated hydrochloric acid are considered by the Commandant (G–MHM) on a case-by-case basis.

§ 153.558 Special requirements for phosphoric acid.

(a) In this part, "phosphoric acid" means superphosphoric acid, phosphoric acid, and aqueous solutions of phosphoric acid.

(b) A phosphoric acid containment system must be—

(1) Lined with rubber;

(2) Lined with a material approved for phosphoric acid tanks by the Commandant (G–MHM); or

(3) Made of a stainless steel that resists corrosion by phosphoric acid.

§ 153.559 Special requirements for nitric acid (less than 70 percent).

A containment system that carrier nitric acid (less than 70 percent) must be of stainless steel that resists corrosion by nitric acid.

§ 153.600 Special requirements for nitropropane.

When a cargo in Table I is referenced to this section, the cargo tank may not be a deck tank.

TESTING

§ 153.806 Stability test and information.

(a) A tankship must meet Part 93 of this chapter.

(b) The tankship must have a manual containing—

(1) Information that enables the master to load and ballast the tankship while keeping structural stresses within design limits;

(2) Damage stability information including, but not limited to, all loading restrictions necessary to ensure the tankship meets the requirements for its hull type; and

(3) Trim information.

Subpart C—Operations

GENERAL

§ 153.900 Certificates, letters, endorsements required.

(a) Each U.S. flag vessel carrying a cargo to which this part applies must have its Certificate of Inspection issued under Subchapter D (Tank Vessels) of this chapter endorsed in accordance with this part with the name of the cargo.

(b) Each foreign flag vessel carrying a cargo to which this part applies must have—

(1) A Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk issued by the country of registry and its Letter of Compliance issued under Part 154 of this chapter endorsed under this part with the name of the cargo; or

(2) Its Letter of Compliance issued under Part 154 of this chapter endorsed under this part with the name of the cargo.

§ 153.901 Document on bridge.

No person may operate a vessel that has on board a cargo to which this part applies unless the endorsed document required by § 153.900 is under glass on the bridge of that vessel.

§ 153.902 Cargo antidotes.

No person may operate a tankship that carries a cargo listed in Table I unless the tankship has on board the antidotes described for the cargo in the "Medical First Aid Guide for Use in Accidents Involving Dangerous Goods," published by IMCO.

§ 153.904 Copy of this subchapter on board.

No person may operate a tankship unless a copy of this part and Parts 34 and 35 of this chapter are on board.

§ 153.905 Limitations in the endorsement.

No person may operate a tankship unless he complies with all limitations in the endorsement on the vessel's Certificate of Inspection, or Letter of Compliance.

§ 153.906 Cargo quantity limitations.

(a) No person may load any cargo tank with more than 1250 m^3 (approx. 44,140 ft^3) of a cargo requiring a type I containment system, or may any person operate a tankship having on board a tank containing in excess of 1250 m^3 of a cargo requiring a type I containment system.

(b) No person may load any cargo tank with more than 3000 m^3 (approx. 106,000 ft^3) of a cargo requiring a type II containment system, nor may any person operate a tankship having on board a tank containing in excess of 3000 m^3 of a cargo requiring a type II containment system.

§ 153.907 Cargo information cards.

(a) No person may operate a tankship unless a cargo information card for each cargo being transported that is listed in Table I is carried either on the bridge, in the ship's office, or in another location easily accessible to the person in charge of the watch.

(b) While a tankship is moored at a terminal, the senior deck officer shall ensure that an additional set of information cards in English is held by the terminal personnel.

(c) Each card must be at least 17 cm x 24 cm (approx. 7" x 9½"), with printing on one side only and must contain the following information about the cargo:

(1) Its name, as listed in table I.

(2) Its appearance.

(3) Its odor.

(4) The hazards involved in handling it, instructions for safe handling, and any special handling procedures, such as inerting.

(5) Procedures to follow in the event of spills, leaks, equipment breakdown, or uncontrolled cargo release.

(6) Procedures to follow if someone is exposed to the cargo.

(7) Effective fire fighting procedures and extinguishing agents.

§ 153.908 Cargo location plan.

(a) The cargo location plan must show the location and number of each cargo tank and the name of the cargo of each tank.

(b) The cargo location plan must be kept with each required set of cargo information cards.

(c) Cargo names on the plan may not differ from those listed tables I, II, or § 30.25–1 of this chapter.

§ 153.912 Certificate of inhibition or stabilization.

(a) No person may operate a tankship carrying a cargo referenced to this paragraph in Table I without written certification, carried on the bridge of the tankship, from the shipper that the product is inhibited.

(b) No person may operate a tankship carrying a cargo referenced to this paragraph in Table I without written certification, carried on the bridge of the tankship, from the shipper that the product is stabilized.

(c) The certification required by this section must contain the following information:

(1) Whether the cargo is inhibited or stabilized.

(2) The name and concentration of the inhibitor or stabilizer.

(3) The date the inhibitor or stabilizer was added.

(4) The length of time the inhibitor or stabilizer is effective.

(5) Any temperature limitations qualifying the inhibitor's or stabilizer's effective lifetime.

(6) The action to be taken should the time of voyage exceed the inhibitor's or stabilizer's useful life.

§ 153.918 Shipping document.

No person may operate a tankship without a shipping document, such as a manifest, on the bridge of the tankship completed by the shipper, the tankship's master, the shipowner, or the tankship's agent that lists for each cargo on board—

(a) The tank in which the cargo is stowed;

(b) The name of the shipper;

(c) The location of the loading terminal;

(d) The cargo name listed in Table I or § 30.25–1 of this chapter, or the shipper's name for the cargo if it is not listed; and

(e) The quantity of the cargo.

§ 153.920 Copy of shipping document furnished the transfer terminal.

While a tankship is moored at a transfer terminal, the senior deck officer shall ensure that the terminal is furnished at least one copy of the shipping document.

§ 153.922 Obstruction of pumproom ladderways.

The senior deck officer shall ensure that all cargo pumproom ladderways are unobstructed.

§ 153.924 Opening of tanks and cargo sampling.

(a) Except as provided in paragraph (b) of this section, the senior deck officer shall ensure that all cargo tank hatches, ullage openings, and tank cleaning openings are tightly closed at all times.

(b) The senior deck officer may authorize the opening of a cargo tank—

(1) During tank cleaning;

(2) During cargo transfer if Table I allows the carriage of the cargo in a containment system having an open gauging system;

(3) To sample a cargo that Table I allows to be carried in a containment system having a restricted gauging system if—

(i) The tank is not being filled during sampling;

(ii) The vent system has relieved any pressure in the tank;

(iii) The person sampling the cargo wears the protective clothing required during cargo transfer; and

(iv) The tank is closed tightly following sampling.

(c) The senior deck officer shall ensure that cargoes requiring closed gauging are sampled only through the controlled sampling arrangement required by § 153.404(b).

§ 153.926 Entry into spaces containing cargo vapor.

(a) No person may enter a cargo handling space without the permission of the senior deck officer.

(b) Before permitting anyone to enter a cargo handling space, the senior deck officer shall ensure that—

(1) The compartment is free of toxic vapors and has sufficient oxygen to support life; or

(2) Those entering the space wear protective equipment with breathing apparatus, and an officer closely supervises the entire operation.

§ 153.928 Emergencies.

The person in charge of a tankship may deviate or allow a deviation from any rule in this subpart to the extent he determines necessary in any emergency endangering the ship, its crew, or people nearby.

Cargo Transfer Procedures

§ 153.950 Person in charge of cargo transfer.

(a) The senior deck officer shall ensure that cargo transfer operations are supervised by a person designated as a person in charge of cargo transfer under this section.

(b) No person may serve, and no one may use the services of a person, as a person-in-charge of cargo transfer on a U.S. flag tankship unless he—

(1) Is designated by the master; and either

(2) Holds a valid deck license endorsed under 46 CFR 10.05 for the grade of cargo being transferred and authorizing service aboard the vessel transferring cargo; or

(3) Is one of the tankermen required for a small vessel by 46 CFR 31.14–1(b).

(c) No person may serve, and no one may use the services of a person as a person in charge of cargo transfer on a foreign flag tankship unless the person—

(1) Holds a valid document issued by the flag administration authorizing service as a person in charge aboard the vessel that is transferring cargo;

(2) Is designated by the master;

(3) Is readily able to communicate in English either directly or through an interpreter who is available to him during the transfer; and

(4) Has studied and understands his responsibilities as described in this subchapter.

§ 153.951 Signals during cargo transfer.

The senior deck officer shall ensure that—

(a) The tankship displays a red flag in the day and a red light at night when transferring cargo while fast to a dock;

(b) The tankship displays a red flag when transferring cargo while at anchor; and

(c) The red flag or the red light is visible from all sides of the tankship.

§ 153.952 Warning signs.

(a) When transferring cargo while fast to a dock or while at anchor in port, a tankship must display a warning sign at the gangway facing the shore so that it may be seen from the shore and another warning sign facing outboard towards the water so that it may be seen from the water.

(b) Except as provided in paragraph (f) of this section, each warning sign must have the following legends:

(1) Warning.

(2) Dangerous Cargo.

(3) No Visitors.

(4) No Smoking.

(5) No Open Lights.

(c) Each letter must be block style, black on a white background.

(d) Each letter must—

(1) Be 7.5 cm (approx. 3 in.) high;

(2) Be 5 cm (approx. 2 in.) wide except for "M" and "W" which must be 7.5 cm (approx. 3 in.) wide and the letter "I" which may be 1.3 cm (approx. ½ in.) wide; and

(3) Have 1.3 cm (approx. ⅓ in.) stroke width.

(e) The spacing must be—

(1) 1.3 cm (approx. ½ in.) between letters of the same word;

(2) 5 cm (approx. 2 in.) between words;

(3) 5 cm (approx. 2 in.) between lines; and

(4) 5 cm (approx. 2 in.) at the borders of the sign.

(f) The legends "No Smoking" and "No Open Lights" are not required when the cargoes on board the tankship are neither flammable nor combustible.

§ 153.953 Incompatible cargo.

(a) The person in charge of cargo transfer may not authorize the loading of incompatible[4] cargoes into cargo containment systems unless the cargo containment systems are separated by double walls or double bulkheads, such as—

(1) Cofferdams;

(2) Empty tanks;

(3) Tanks containing mutually compatible cargo; and

(4) Piping tunnels.

(b) The person in charge of cargo transfer may not authorize loading of incompatible cargoes into cargo containment systems that have common piping or venting systems.

§ 153.954 Cargo transfer piping.

The person in charge of cargo transfer shall ensure that—

(a) Cargo is transferred to or from a cargo tank only through the tankship's cargo piping system; and

(b) All cargo vapor is returned to shore through the valved connection on the venting system if—

(1) The cargo requires closed gauging, is referenced to § 153.372 or is referenced to § 153.525;

(2) The transfer terminal has vapor return equipment; and

(3) In his estimation the vapor return equipment is adequate to handle the vapor expected from the tank.

§ 153.955 Cargo hose.

The person in charge of cargo transfer may not authorize the connection of a hose to a cargo containment system unless—

(a) The hose is marked as meeting the standards of § 153.956;

(b) The date of the hose's last pressure test is within one year of the date on which the hose is used to transfer cargo;

(c) The recommended working pressure marked on a hose used for discharge meets or exceeds the working pressure marked on the cargo piping at the hose connection; and

(d) The cargo's temperature is within th manufacturer's recommended maximum and minimum hose temperatures.

§ 153.956 Standards for marking of cargo hose.

To be marked as meeting the standards of this section, the hose assembly must meet the following standards:

(a) Each hose assembly must have—

(1) Full threaded connections;

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[4] Incompatible cargoes are listed in NVIC 4–75, available from the Commandant (G-MHM-3/83), U.S. Coast Guard, Washington, D.C. 20590. Telephone number: (202) 426-1577.

(2) Flanges that meet standard B16.5, Steel Pipe Flanges and Flanges Fittings, or standard B16.31, Nonferrous Pipe Flanges, of the American National Standards Institute; or

(3) Quick-connect couplings that are acceptable to the Commandant (G-MMT).

(b) Each hose assembly must be marked with the—

(1) Date of manufacture;

(2) Minimum bursting pressure;

(3) Recommended working pressure;

(4) Date of the last test required by paragraph (f) of this section;

(5) Pressure used for that test; and

(6) Manufacturer's recommended maximum and minimum temperatures.

(c) A cargo hose assembly must have a minimum bursting pressure of at least 52.5 kp/cm² gauge (approx. 750 psig) and a recommended working pressure of at least 10.5 kp/cm² gauge (approx. 150 psig).

(d) The minimum bursting pressure marked on the hose may not exceed—

(1) That stated by the manufacturer of the hose assembly;

(2) Five times the manufacturer's recommended working pressure; and

(3) Five times the test pressure used in the last test under paragraph (f) of this section.

(e) The recommended working pressure may not exceed twenty per cent (one fifth) the minimum bursting pressure.

(f) A cargo hose assembly must be inspected and tested by placing it in a straight, horizontal position so that its entire external surface is accessible and ascertaining that the hose assembly—

(1) Has no loose covers, kinks, bulges, soft spots, and no gouges, cuts, or slashes that penetrate any hose reinforcement;

(2) Has no external and, to the extent internal inspection is possible with both ends of the hose open, no internal deterioration; and

(3) Does not burst, bulge, leak, or abnormally distort under static liquid pressure at least as great as the recommended working pressure.

§ 153.957 Discharge by gas pressurization.

The person in charge of cargo transfer may not authorize cargo discharge by gas pressurization unless—

(a) The tank to be offloaded has an SR or PV venting system;

(b) The pressurizing medium is either the cargo vapor or a nonflammable, nontoxic gas inert to the cargo; and

(c) The pressurizing line has—

(1) A pressure reducing valve whose setting does not exceed 90% of the tank's RVS and a manual control valve between the pressure reducing valve and the tank; or

(2) For an inert gas medium—

(i) A safety relief valve with a cross sectional flow area at least equal to that of the line, whose relieving pressure does not exceed 90% of the tank's RVS;

(ii) A manual control valve between the safety relief valve and the tank; and

(iii) A check valve between the manual control valve and the tank.

§ 153.958 Discharge by liquid displacement.

The person in charge of cargo transfer may not authorize cargo discharge by liquid displacement unless the liquid supply line to the tank has—

(a) A safety relief or pressure reducing valve set to operate at no more than 80 percent of the tank's RVS; and

(b) A manual control valve between the tank and the supply line's safety relief valve or pressure reducing valve.

§ 153.960 Approval to begin transfer required.

No person may transfer cargo or make connections for cargo transfer unless he has authorization from the person in charge of cargo transfer.

§ 153.961 Protective clothing required.

When Table I refers to this section, the senior deck officer shall ensure that every person forward of the accommodation deckhouse who is involved with cargo sampling, gauging, or making or breaking cargo connections wears a large apron, boots, gloves, and tight-fitting goggles.

§ 153.962 Preparation for cargo transfer.

The person in charge of cargo transfer may not approve and must discontinue cargo transfer unless—

(a) No fires or open flames are on deck or in compartments near the hose connections, when Table I requires the cargo's containment system to have fire protection;

(b) Any electrical bonding of the tankship to the transfer facility is made before the cargo transfer piping is joined;

(c) The cargo hose is made of materials that are not attacked excessively by the cargo;

(d) The transfer connections have enough slack to allow for vessel movement;

(e) The transfer connections are supported by tackles;

(f) The cargo high level alarms are functioning correctly;

(g) Joints and couplings are gasketed and mated tightly;

(h) Flanges are bolted tightly;

(i) No repair work is underway in hazardous areas;

(j) Cargo and sea valves are properly set, with those sea valves connected to cargo piping lashed or sealed shut;

(k) Venting system valves are set for loading and are operating properly;

(l) All scuppers are plugged;

(m) Smoking is limited to safe places;

(n) Fire fighting and safety equipment is ready;

(o) He is in effective communication with the transfer terminal;

(p) The person in charge of the transfer terminal has acknowledged that he is ready to transfer;

(q) Pressures on the cargo transfer and containment systems are within their designed limits;

(r) No refrigerated or pressurized cargo is leaking, and any other leakage is contained by drip pan or bucket; and

(s) No vessels that would hazard cargo transfer are alongside the tankship.

§ 153.964 Supervision of cargo transfer.

The person in charge of cargo transfer shall supervise the operation of cargo system valves and monitor the cargo loading rate to avoid overfilling cargo tanks.

§ 153.966 Gauging with a sounding tube.

(a) No person may remove the cover of a sounding tube unless he has authorization from the person in charge of cargo transfer.

(b) The person in charge of cargo transfer may not authorize removal of the cover from a sounding tube gauge unless all tank pressure has been relieved through the tank's venting system.

§ 153.968 Termination procedures.

Upon completion of the transfer operation, the person in charge of cargo transfer shall ensure that—

(a) The cargo transfer connections are closed off;

(b) The transfer lines and hoses are drained of cargo, either into the tank or back to the transfer terminal;

(c) Any electrical bonding between the vessel and the shore facility is broken only after the cargo hose is disconnected and all spills removed; and

(d) Each vent system is returned to its nonloading configuration.

§ 153.970 Tank filling limitations.

The person in charge of cargo transfer shall ensure that the amount of cargo in a tank does not exceed the tank's capacity at any ambient temperature between −17.8° C. (approx. 0° F) and 46° C (approx. 115° F).

§ 153.977 Explosives.

No person may load, off-load, or carry a cargo listed in this part on board a vessel that carries explosives unless he has the written permission of the Commandant (G-MHM).

§ 153.978 Transfer of packaged cargo or ship's stores.

The person in charge of cargo transfer may neither begin nor continue the transfer of a flammable or combustible cargo while packaged cargo or ship's stores are transferred unless the transfer of packaged cargo or ship's stores does not hazard transfer of the flammable or combustible cargo.

§ 153.979 Illness, alcohol, drugs.

The senior deck officer may not use the services of any person who appears to be intoxicated by alcohol or drugs or appears to be so ill as to render him unfit for a particular service on the tankship.

SPECIAL CARGO PROCEDURES

§ 153.1000 Special operating requirements for cargoes reactive with water.

When Table I refers to this section, the senior deck officer must ensure that the cargo—

(a) Is carried only in a containment system completely isolated from any sys-

tems containing water, such as slop tanks, ballast tanks, cargo tanks containing slops or ballast, their vent lines or piping; and

(b) Is separated by double walls, such as cofferdams and piping tunnels, from any system containing water, as for example those described in paragraph (a) of this section.

§ 153.1010 Alkylene oxides.

(a) Before he loads a cargo containment system with an alkylene oxide, (i.e. a cargo referenced to this section in Table I), the person in charge of cargo transfer shall purge the containment system until the oxygen content of the cargo tank is less than 2 percent by volume.

(b) The person in charge of cargo transfer may not authorize the transfer of an alkylene oxide unless the ventilation or inert gas systems required by §§ 153.530(f) and (g) are operating.

(c) The person in charge of an alkylene oxide cargo transfer shall ensure that—

(1) No alkylene oxide vapor or liquid is released to the atmosphere during cargo transfer;

(2) No vapor return system connected to an alkylene oxide containment system is at the same time connected to another containment system;

(3) Alkylene oxide is discharged only by a deepwell pump or inert gas displacement;

(4) Transfer hose meets § 153.530(i) and is marked "For Alkylene Oxide Transfer Only"; and

(5) A water hose is laid out on deck with water pressure to the nozzle, and all alkylene oxide spillages are washed away immediately.

(d) After loading alkylene oxides, the person in charge of cargo transfer shall check the composition of the vapor space above the tank and purge the space with inert gas until the oxygen content is below 2% by volume.

§ 153.1011 Use of alkylene oxide containment systems and hoses with other products.

(a) An alkylene oxide may not be carried in a containment system that is endorsed to carry other cargoes unless the containment system is cleaned to the satisfaction of a Coast Guard marine inspector before the alkylene oxide is carried.

(b) No other cargo may be loaded into a containment system endorsed to carry an alkylene oxide unless the containment system has been cleaned of alkylene oxide to the satisfaction of a Coast Guard marine inspector.

(c) A hose marked "For Alkylene Oxide Transfer Only" may not be used for the transfer of another cargo.

§ 153.1020 Unusually toxic cargoes.

(a) The senior deck officer shall ensure that a heat transfer medium that has been circulated through a cargo referenced to this section in table I is not circulated through a cargo not referenced to this section unless he determines the medium to be uncontaminated with cargo; and

(b) No person may discharge overboard condensed steam from the heating system of a cargo referenced to this section in Table I unless he first determines the condensate to be uncontaminated with cargo.

§ 153.1025 Motor fuel antiknock compounds.

(a) No person may operate a tankship that carries any cargo in a containment system approved for motor fuel antiknock compounds containing lead alkyls except one to be used in the manufacture of motor fuel antiknock compounds.

(b) The senior deck officer shall ensure that no person enters a pumproom or void space that has piping from a containment system approved for motor fuel antiknock compounds containing lead alkyls unless the pumproom or void space atmosphere has been analyzed for its lead content and found to be less than 0.15 mg/m^3.

(c) No person may enter a cargo tank approved for motor fuel antiknock compounds containing lead alkyls without prior specific authorization of the Commandant (G-MHM).

§ 153.1035 Stabilization of acetone cyanohydrin.

No person may operate a tankship having on board acetone cyanohydrin unless the acetone cyanohydrin is stabilized with an inorganic acid.

§ 153.1040 Carbon disulphide.

(a) No person may load, carry, or discharge carbon disulphide unless the cargo tank has a water pad over the cargo of at least one meter (approx. 40 in.).

(b) No person may remove a cargo pump for a containment system that carries carbon disulphide unless—

(1) The containment system has a gas free certificate issued under the standards in § 35.01-1 of this chapter; or

(2) The vapor space in the pump well is filled with water.

§ 153.1045 Inorganic acids.

When Table I refers to this section, the person in charge of cargo transfer shall ensure that the legends "NO SMOKING" and "NO OPEN LIGHTS" are displayed on the warning sign required in § 153.952(a) when cargo is transferred.

§ 153.1046 Sulfuric acid.

No person may liquefy frozen or congealed sulfuric acid other than by external tank heating coils.

§ 153.1052 Carriage of other cargoes in acid tanks.

Another cargo may be carried in a cargo containment system endorsed to carry either sulfuric acid, hydrochloric acid, or phosphoric acid only with specific authorization from the Commandant (G-MHM).

§ 153.1055 Nitropropane.

(a) No person may load or carry 1- or 2-nitropropane in a tank having heating coils unless the heating coils have been isolated from their heat source by completely disconnecting them, for example, by inserting a blanking plate or by removing a spool piece in a steam supply line.

(b) No person may load or carry 1- or 2-nitropropane in a tank located in a hold or adjacent to a cargo whose temperature exceeds 40° C (approx. 104° F).

§ 153.1060 Inerted cargoes.

No person may operate a tankship having on board a cargo referenced to this section in Table I or transfer such cargo unless each inert gas system required for the cargo by this part is operating.

MAINTENANCE

§ 153.1500 Venting system rupture disks.

The senior deck officer shall ensure that a relief valve exposed to a cargo after the failure of a rupture disk or breaking pin is cleaned and found to operate properly before the next cargo is loaded into the tank.

§ 153.1502 Fixed ballast relocation.

No person may remove or relocate fixed ballast unless—

(a) The change is first approved by the Commandant (G-MMT); or

(b) The ballast is temporarily moved under the supervision of a marine inspector for examination or repair of the tankship.

§ 153.1504 Inspection of personnel emergency and safety equipment.

No person may operate a tankship unless the personnel emergency and safety equipment required by § 153.214 has been inspected within the previous 30 days and found in good condition and properly operating at the most recent inspection.

APPENDIX

TABLE II.—Bulk liquid cargoes that may be carried in vessels having neither a Certificate of Inspeciton under subchapter D (Tank Vessels) nor a permit under this part:

ammonium nitrate, urea, water solution, 2% or less NH_3
(2-chloro-4-ethylamino-6-ispropylamino - 5 - triazine, water solution)
hexamethylene diamine adipate
lignin liquor (calcium ligno-sulfonate, water solution)
methyl chloroform (1, 1, 1-trichloroethane)
perchloroethylene
pentasodium salt of diethylene triamine pentaacetic acid, water solution
tetrasodium salt of ethylene diamine tetraacetic acid, water solution
sodium lignosulfonates, sodium hydroxide (not exceeding 1% by weight), water solution
molasses
magnesium hydroxide/suspensions in water
calcium chloride in water
urea in water
water
mixtures solely of the cargoes in this list.

Dated: June 14, 1976.

H. G. LYONS,
Captain, U.S. Coast Guard, Acting Chief, Office of Merchant Marine Safety.

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